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DAUGHTER CYST FORMATION IN HYDATID DISEASE: SOME OBSERVATIONS ON ITS CAUSATION AND EFFECTS.¹

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Introduction.

The typical morphology of the hydatid parasite is exemplified by the cysts found in the viscera of infested sheep. These animals normally act as intermediate hosts and form part of the food supply of the dog, the definitive host, and in them the parasite reaches its optimal development as regards the production of scolices. A simple univesicular cyst is formed and from six to eight months after infestation brood capsules containing scolices develope in large numbers from the germinal membrane. The hydatid fluid in the cyst acts as a buffer and protects the developing scolices. The laminated membrane is also formed by the germinal membrane and acts as a support to the delicate inner nuclear layer. Owing to the fact that the

outer laminations are first laid down, they become greatly stretched as the cyst grows in size and when this is ruptured, they contract, the cyst turns inside out and the brood capsules are set free. With regard to permeability the laminated layer prob-ably has a selective action which insures retention of the specific fluid and the entry by osmotic processes of a supply of necessary substances for the growth of the parasite. As the experiments of Chauffard and Widal(1) suggest, it also has a protective action in preventing the entry of noxious substances. These observers immersed daughter cysts in various bacterial cultures and found that the contents remained sterile for many days. The elaborate process of cyst formation is in the main protective and appears to be dictated by the necessity of insuring the survival, development and final setting free of the numerous fragile embryo worms -for as such the scolices must be regarded. It is an interesting example of the care and prodigality of nature where reproduction is concerned.

In the human subject also unilocular cyst production must be regarded as the typical form and such cysts may reach a size which far exceeds that seen even in old animals. The production of scolices, however, is never so prolific as in the *Herbivora*.

¹Read at a meeting of the Melbourne Surgical Association on July 20, 1925.

Very often, moreover, in human subjects and occasionally in animals another phenomenon may be observed. This is the formation of daughter cysts inside the confines of the original mother cyst. Under these conditions the cyst is found to contain small cysts which are replicas of the original cyst, in that they are composed of an outer laminated membrane and an inner nuclear layer and often contain brood capsules. They vary somewhat in size, may be extremely numerous and are found floating in fluid or tightly packed together. More commonly the latter is the case and the whole cavity may be filled with cysts embedded in hyaline débris and moulded by mutual pressure (see Figure I.).

The tension inside the retaining adventitia is moderately high and after incision the small cysts readily come tumbling out. In some cases these

small cysts contain several smaller cysts granddaughter cysts. This "pill-box" appearance as it has been called, is in marked contrast to the typical development. It has been commented upon by all observers and appears to be almost a characteristic of the disease in human beings. The fact that it is not a universal finding even in human cases. however, led various authorities to differentiate the two appearances by different names.

meister⁽²⁾ and Leuchart⁽⁸⁾ named this form *Echinococcus altricipariens* and *Echinococcus hydatidosus* respectively as distinct from the unilocular cyst which they respectively called *Echinococcus scolicipariens* and *Echinococcus granulosa*.

It was thought that the more complex form was confined to human subjects while the other was typical of the disease in animals. Further investi-

gations have shown that they are simply different morphological conditions of the same parasite. Even in the same infestation some cysts possess daughter cysts while others remain simple. Transmission of the disease to dogs by means of feeding experiments has proved that the mature worms derived from both types are identical. The facts may be expressed diagramatically as shown below.

The reason for the formation of daughter cysts has always been somewhat obscure. Most authorities deal with the problem in an unsatisfactory manner and few attempt a logical explanation. Dévé⁽⁴⁾ alone has put forward a rational view of both the reason for and the method of their formation.

The present paper is an attempt to correlate a number of observations which I have made during the past two years. The material studied has con-

sisted of a large number of cysts removed at operation by my colleagues and myself at the Melbourne Hospital. In all of these the clinical and the pathological findings have been carefully compared. Also weekly supplies of the viscera of in-fested sheep have been obtained from the city abattoirs to provide antigenic fluid for the performance of various serological tests for the diagnosis of the disease. Over a thousand of these cysts have been carefully



Figure I.

Typical Appearance of Daughter Cyst Formation in a Semi-Pedunculated Hydatid Cyst of the Liver.

examined in some cases by the microscopical examination of sections.

Theories as to the Reason of Daughter Cyst Formation.

It must be admitted that the phenomenon of daughter cyst formation is not universal, that it is not necessary biologically and that it is an atypical and more or less accidental development. Several theories have been formulated to explain it.

NORMAL.

 $Worm \rightarrow Ova \rightarrow Cysts \rightarrow Brood Capsules \rightarrow Scolex \rightarrow Worm.$

OCCASIONALLY.

Worm \rightarrow Ova \rightarrow Cysts \rightarrow Daughter Cysts \rightarrow Brood Capsules \rightarrow Scolex \rightarrow Worm.

In the first place the belief that there are two distinct parasites has been exploded by a great deal of direct experimental work and by much pathological and clinical evidence.

Secondly, it has been suggested that daughter cyst formation is an expression of fecundity shown by hydatid cysts which have arrived at their full development. The true index of fecundity must be the production of brood capsules and not such a phenomenon as the formation of daughter cysts in which brood capsules are often few in number. In the domestic herbivora which must be regarded as ideal and natural intermediate hosts, daughter cyst formation is very rare, but the cysts are as a rule very fertile. In the human subject multiple cysts of apparently the same age sometimes occur in which some contain daughter cysts while others contain brood capsules only. The age of the cyst

alone does not necessarily determine daughter cyst formation, as very large cysts of many years' standing containing up to ten litres of fluid have been recorded in which no daughter cysts were present although there were many brood capsules.

The third view regards daughter cyst formation as the result of some accident or interference with the original cyst. Dévé(5) supports this view and concludes an interesting article on the subject as follows: "On peut resumer les notions que nous venons d'exposer dans cette formule-Chez l'homme tout kyste hydatique multivesiculaire est un kyste ayant souffert." A comparison of the immunity reactions in this disease with the operative and pathological find-

ings has led me independently to the same conclusion.

The theory supposes that during the life of certain cysts various accidents may occur which cause interference with nutrition and menace the vitality of the germinal membrane and the production of scolices. To combat this menace daughter cyst formation may occur under certain conditions and must be regarded as a purely defensive action on the part of the parasite. This hypothesis alone explains all the observed clinical, experimental and pathological facts. The various disturbances or abnormal states which may possibly bring about this development, are the following:

(i.) Mechanical trauma which may take the form of direct blows, muscle contractions, puncture with a trocar or operative interference.

(ii.) Chemical trauma by the entry of bile, urine or similar secretion into the potential space be-

tween the cyst and the adventitious capsule or even into the cyst itself.

(iii.) Infective processes by the bacterial invasion of the potential space between the cyst and the adventitious capsule as the result of a blood-borne infection or encroachment on a secreting channel. It is also possible that the presence of suppuration in the neighbouring tissues or the existence of a general toxemia in the host may lead to the passage of dialysable products into the cyst and so excite the production of daughter cysts.

Mode of Action of the Above Causes.

Trauma of any kind may give rise to separation of the germinal membrane of the mother cyst which may then float freely in the fluid of the cyst. Here it finds its supporting laminated membrane missing and the delicate developing brood capsules and

scolices endangered. As a reactive measure it forms fresh laminated membrane around small islets of nucleated tissue. Figure II. shows an example of this type of daughter cystdevelopment.

Another effect of more or less severe trauma is to cause lowering of tension in the cyst from escape of fluid and also the entry of abnormal substances. Under these new conditions the continued development of the scolices appears to be impossible and the parasite in order to fulfil its biological destiny attempts often with complete success to form a new series of defensive laminated cysts within which these embryonal structures can go on developing. This reaction may be likened to

the provision of a second line of defence which protects against the entry of noxious substances and by virtue of its rigidity acts as a mechanical support.

That this reaction is very often successful is shown by the presence of brood capsules and scolices inside many quite small daughter cysts. It is obvious that the injury to the parasite is not infrequently so severe that no such defensive reaction is possible. Under these conditions the fluid is evacuated or absorbed, the parasite dies, shrinks and becomes folded upon itself, while the adventitia becomes thickened, sclerosed and even calcified. In some cases after puncture of the cyst cure by fibrosis has been recorded after the death of the parasite whilst fibrotic and calcified cysts are not an uncommon finding at autopsy.

Rupture of the cyst into a natural channel such as a large bile duct, a bronchus, the alimentary canal or urinary passages usually causes death of



FIGURE II.

Development of Young Daughter Cysts in Free,
Separated, Germinal Membrane of a small
Hydatid Cyst. Original.

the parasite with partial or complete evacuation of the cyst contents. The leakage of bile into the perivesicular space in small or large quantities or even into the cavity of the cyst itself gives rise to changes in the biochemical nature of the hydatid fluid. It is obvious that it is not necessary for bile in high concentration to be in contact with the laminated membrane for some diffusion of toxic

products to occur. This is more likely to happen because there will be an associated disturbance of the nutrition of the cyst resulting from local involvement of the blood vessels of the adventitia. The degree of chemical change thus induced in the fluid varies greatly. If only slight, the parasite may overcome it

parasite may overcome it and react with the formation of daughter cysts. If there is entry of bile in large quantities, the parasite is killed and one occasionally finds large unilocular cysts with marked biliary contamination of its contents, the parasitic elements being dead.

Gross infection of the cyst either by the blood stream or by natural channels causes death of the cyst, but it is possible that milder degrees of infection may give rise to reactive daughter cyst formation. It is apparent that all the above changes, whether due to natural causes or provoked artificially, are more likely to occur as age advances and, as will be seen, this is borne out by the evidence now to be adduced.

Pathological and Clinical Evidence. Hepatic Cyals.

In the adult daughter cyst formation is almost invariably found in large

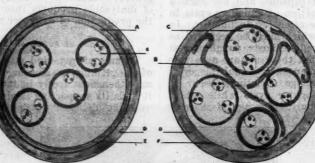
hepatic cysts. Of thirty-two such cysts dealt with by operation this was so in twenty-eight. A typical cyst contains many tightly packed daughter cysts often moulded by mutual pressure and surrounded by the adventitia which is frequently coated with shaggy inspissated material instead of being lined by the mother cyst (Figure III.). The latter is rarely if ever found intact, but is either lying collapsed amongst the daughter cysts or is represented by hyaline débris. The daughter cysts are often embedded in this hyaline débris which may be augmented by moulting of similar material from the daughter cysts themselves.

Sometimes fluid is present in which the daughter cysts float. In these cases it is usually found that

many dead and collapsed daughter cysts are present and that the fluid is turbid and bile-stained. It is practically never clear and it is almost certain that it is not the fluid of the original mother cyst, but is derived from leaking or ruptured daughter cysts. This absence of fluid in many

cases is evidence that the original cyst became inefficient and owing to its disintegration absorption of the fluid has taken place through the adventitious capsule. Figure I. shows well the typical arrangement and packing of the daughter cysts.

The absence of an intact mother cyst is important and throws some light on the possible origin of the daughter cysts. It was at one time considered and is still stated by such writers as Blanchard(6) and Lagos Garcia(7) that the growth of the daughter cysts in itself causes pressure necrosis with death and disin-tegration of the mother cyst. This appears to be founded on incorrrect observations and reasoning. The true explanation is that the same cause, that is trauma, either mechanical or chemical, leads to ultimate disintegration of the mother cyst and the



Diagram, Showing (A) the accepted and (B) the true view of the typical Arrangement of original Mother Cyst and Daughter Cysts.

A = Laminated Membrane; B = Laminated Membrane lying free amongst the Daughter Cysts; C = Daughter Cysts containing Scolices; D = Adventitious Capsule; E = Germinal or inner Nucleated Layer; F = Rough inner coating of Adventitie in typical cases of Daughter Cyst Formation.



Patent Bile Ducts enclosed in the Adventitia of a young hydatid Cyst (Ocular 2, Objective 7).

formation of daughter cysts.

Hepatic cysts containing daughter cysts also almost invariably show staining with bile. This may be very slight, a local pigmentation or a deposit of inspissated bile pigment over an area so small that it may be readily overlooked. Careful search will, however, reveal it. It has been empha-

sized before by the writer (8) that the epithelium of the bile ducts has a remarkable power of persistence and that biliary channels with intact lamina can frequently be demonstrated in the adventitia of cysts almost in contact with the laminated membrane of the parasite (see Figure IV.). The entry of bile into the potential pericystic space is often only a matter of time and with an occasional exception is the rule in liver cysts. As mentioned above the effect produced depends solely on the degree of contamination.

In some cases there appears to be an intermittent extravasation of small amounts of bile. Some cysts show definite evidence of biliary leaks of different dates, as is shown by different types of pigmentation and these are doubtless due to the presence of a valvular opening into a bile duct. In these one finds intact daughter cysts, collapsed daughter cysts which have succumbed to one of the extravasations, some hyaline débris and bile stained fluid which often contains flakes of inspissated bile pigment. In some of these cases and in this type of case alone does one find grand-daughter cysts inside daughter cysts. Possibly the question of survival under these conditions depends upon a cessation of the biliary inflow until it is diluted or in some way counteracted.

In other cases the opening into a bile duct becomes larger with the increasing growth of the cyst and the cyst is killed, the contents being not infrequently evacuated through the biliary channels. That the entry of bile in sufficient amounts can kill the parasite is well known. In these cases the hydatid fluid is absorbed and the collapsed cyst or cysts become a shrunken convoluted mass contained in a thick fibrous capsule and stained green or orange with altered bile. If evacuation through the bile ducts takes place, the passage of small daughter cysts formed as the result of previous leaks or of pieces of hydatid membrane may closely simulate gallstone colic. A common sequel of the entry of bile into the cyst is the entrance of microorganisms which find in the dead material a suitable pabulum for growth. Thus suppuration of hepatic hydatids with all the attendant risks of general toxemia or extension to the biliary ducts tends to occur sooner or later. It is as a rule associated with a massive biliary extravasation and is therefore a relatively late occurrence. In a typical case the adventitia is thick which may account for the tardy development of toxic symptoms, the fluid is bile-stained and turbid, while many collapsed daughter cysts are present.

From the pathological and clinical facts it appears that the germinal cells of the parasite which alone have the power of laying down a protective hyaline covering, are extremely resistant, in spite of the fact that they depend for nutrition on osmotic processes and therefore must possess a very narrow margin of safety. It would also appear that in the liver the entry of bile in small amounts is the provocative agent in daughter cyst formation, whereas the entry of large amounts leads to death of the parasite or to the entrance of microorganisms.

Pulmonary Cysts.

It is a striking fact that hydatid cysts of the lungs in adults as well as children rarely contain daughter cysts. Of forty adult cases complete records were kept in twenty and in only two of these were daughter cysts present. In eight cases in children only one and that a large cyst near the diaphragm contained daughter cysts. The actual difference between pulmonary and hepatic cysts is made less striking in recorded cases by the confusion that arises from the extension of cysts of the liver through the diaphragm. Such cysts may open into a bronchus and give rise to the expectoration of daughter cysts (which they invariably contain). The sputum may or may not be bile-stained but in all such cases one should suspect an hepatic origin. The ordinary "grapeskins" expectorated by patients are usually not daughter cysts but pieces of hydatid membrane, disintegrated but still curled from residual elasticity.

The site of the parasite undoubtedly influences its morphology. In subjects presenting multiple cysts simple cysts of the lungs are sometimes found associated with hepatic cysts containing daughter cysts which apparently arose from the same infestation.

The tissue of the lung is very vascular, loose and non-resistant, growth of the parasite is rapid and regular and the adventitious capsule is often not well developed. The rigidity of the thoracic wall protects the cyst against direct trauma and owing to the confined space of the cavity of the thorax pressure symptoms tend to appear early, leading to the recognition of the cyst while it is still simple. The most important determining factor in pulmonary cysts, however, is the ultimate involvement of a bronchus. The cyst, especially if deeply placed, usually encroaches on a patent bronchus, rupture takes place with expectoration of the contents and very often infection of the cavity occurs.

The presence of a small patent bronchus in the adventitia of a cyst would appear to predispose to infection of the perivesicular space and it is conceivable that some cases of daughter cyst formation in this situation have been excited in this way. I have seen an example in the lungs of the sheep. In this specimen there was a slit-like opening into a small bronchus in the adventitia and it is probable that either a slight rupture or a mild degree of infection was responsible for the reactive daughter cyst formation.

Occasionally large unilocular pulmonary cysts are seen and in these the cyst invariably involves the periphery, apparently commencing its growth from just under the pleura. Daughter cyst formation is sometimes seen in connexion with cysts of the pleural cavity. Some of these doubtless are subdiaphragmatic, others subpleural in origin. The latter are due to the quiet rupture of a subpleural pulmonary cyst into the pleural cavity and the evolu-

tion of fresh cysts from the shed germinal elements. Cysts of the Omentum and Abdomen.

Cysts of the omentum and abdomen are not infrequently multiple and as a rule are secondary to rupture or quiet leak of a subserous cyst of the

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liver or spleen. In gross cases of which many have been reported, the whole abdominal cavity may be packed with cysts of all sizes—a condition which has been called hydatidosis. They are usually due to the setting free of actual daughter cysts or other active hydatid elements which implant themselves in the peritoneal cavity as far down as the rectovesical or rectouterine pouch. Primary abdominal hydatids unassociated with hepatic cysts may be multiple or single, but these are extremely rare. The conditions of growth in all are much the same. The implanted hydatid elements often become surrounded by omentum which forms the adventitia

of the new cyst. Sometimes several cysts grow close together and it is not uncommon for coalescence to occur with the production of multiloculated omental cysts. The cysts produced secondarily in the abdomen vary considerably in size, they have as a rule little support from their adventitia, they may hang almost free in the peritoneal cavity and all have a precarious blood supply. From the commencement of their growth in the secondary situation they have a struggle to survive and probably only a certain proportion do so. This is evidenced by the presence of small fibrotic or calcified masses and by the frequency of degenerative processes or capsular sclerosis and calcification in the surviving cysts.

Some of them contain daughter cysts, others do not, while their content in brood capsules and scolices is usually low. The comparatively small production of brood cap-

sules and scolices and the frequency of daughter cyst formation in these cysts are probably due to the relatively poor blood supply. There appears to be no doubt that the poorly organized hyaline material can be laid down under very adverse conditions, conditions under which the growth of the highly developed brood capsules and scolices is quite impossible. It is not uncommon to find in old and often degenerating cysts white, cauliflower-like excrescences of hyaline material studding the inner aspect of the wall of the cysts.

The mechanism in omental cysts would appear to be as follows: The nutrition of the original cyst is poor, degenerative changes occur and allow the entry of serum or other substances from the host. This may cause further degeneration, death of the parasite or a reactive production of daughter cysts. It is possible that in some cases a mild degree of infection from the adjacent bowel causes daughter cyst formation, especially as cysts are often found in close contact with the bowel wall.

In the kidney daughter cyst formation is the rule, although unilocular perirenal cysts occur. The cyst in its growth opens up urinary channels and the stimulus for the production of daughter cysts is the entry of urine.

Subcutaneous Cysts.

Subcutaneous cysts invariably contain daughter

cysts even when they have been growing for a short time and when quite small. I have seen recently a small cyst 4.3 centimetres (one and three-quarter inch) in diameter containing daughter cysts removed from the right pectoral region. This cyst was a recurrence due to the shedding of some hydatid elements at an operation eighteen months previously. In another case a small cyst of the subcutaneous fat of the buttock, at first diagnosed as a lipoma, was removed and it, too, contained many daughter cysts. In these cysts direct trauma is undoubtedly the important factor. Owing to their exposed situation they are all liable to injuries of varying severity and this is the only logical explanation of the presence universal daughter cysts.

The following case history is of interest in this connexion:

A young woman was first seen with a swelling of the lower arm between the triceps and the brachialis anticus muscles. It was

fluctuant and about as large as a small hen's egg and was at first thought to be a lipoma. Excision was recommended, but the patient refused operation. Nine months later she returned with the history that six months previously she had bumped the spot while getting out of a buggy. On examination there was an irregular cystic mass involving the lower third of the arm. The patient stated that it was increasing rapidly in size. Operation revealed many small hydatid cysts which were burrowing along intermuscular planes.

In this case the direct blow on what was obviously a small hydatid cyst caused rupture and the growth of many small daughter cysts.

Cysts of Muscle et Cetera.

Cysts of muscles et cetera always contain daughter cysts which very often have become separated and



FIGURE V.

Bilocular Simple Cyst of the Right Auricular Region of the Heart Projecting between and Adherent to the Layers of the Pericardium.

have made their way along intermuscular and tissue planes so that a multicystic tumour is produced. This appearance is characteristic and frequently the original mother cyst has been disintegrated by the growth of the daughter cysts. Cysts in muscle are subject to two types of traumaone due to the superficial position of most muscles in the body and the other to contraction of the muscle. If sudden the latter can readily cause squeezing of the cyst, separation of the germinal layer or actual rupture and spread of the hydatid elements and the formation of daughter cysts.

Hydatid cysts of the heart are sometimes seen, particularly in the ventricular wall or the auriculoventricular septum. These always contain daughter cysts which are remarkably uniform in size. The sharp muscular contractions of the heart are constant and strong enough to induce reactive daughter cyst formation. I have recently seen at autopsy a bilocular hydatid cyst of the wall of the right auricle of the heart which projected into the pericardial cavity (Figure V.). This cyst averaged 5.6 centimetres (two and a quarter inches) in diameter and was a simple cyst. In this situation muscle contractions could have little if any effect and doubtless this is the reason for the absence of daughter cysts. It is obvious that in cysts of muscle many small cysts will distribute trauma more evenly and lead to better protection and more stable conditions for the developing scolices.

The Age Factor.

The age of the cyst has an important bearing on the question of daughter cyst production. In the first place the increase in size of the cyst with age leads to encroachment on natural channels and in the second the longer a cyst has existed, the more chances there are for any other complications to occur. It has been stated by Dévé and others that the natural senescence of the mother germinal membrane with arrest of its growth and thickening of the surrounding capsule is in itself one of the causes of the production of daughter cysts. This is rather a far-fetched explanation of what must be regarded rather as a rejuvenescence on the part of the parasite. I am convinced also that the formation of daughter cysts themselves is often brought about by growth from the cells of the original germinal membrane. Probably the older a cyst is, the thicker the adventitia and the more precarious the nutrition. These factors may be sufficient to induce reactive daughter cyst formation and no doubt the formation of daughter cysts in deeply placed cysts such as those of the spleen may have this ætiology.

It is a striking fact that cysts in children rarely contain daughter cysts. Thus of forty three patients treated at the Children's Hospital, for a record of which I am indebted to Dr. H. B. Graham, only three manifested daughter cysts. All of these were hepatic cysts into which bile had entered and two were suppurating. This interesting clinical fact has been emphasized by many observers. Dévé⁽⁹⁾ states that daughter cysts are found in only 10%

of patients before puberty. Lagos Garcia (10) analysed two hundred and seventy-four cases in children under fourteen years of age and found daughter cysts in only 8.4%. Prudencio de Pena (11) found 8% in a series of one hundred and seventy-four cases. Other South American observers—Possedas, Herrera Vega and Cranwell—have all reported the same peculiarity of cysts in children. The cysts of young people are necessarily young cysts and have much less chance of becoming complicated by mechanical or chemical trauma. It is obvious that as adult age is reached, the proportion of cases with daughter cysts will increase and this is the experience of all observers.

In the domestic animals hydatid cysts are usually free from daughter cysts. In the sheep and the pig multiple cysts of the liver and lungs are the rule, but even in old animals they rarely reach the enormous dimensions sometimes seen in human subjects. No doubt biologically these animals are much more ideal hosts than man and this may be the reason why they usually show an amazing fecundity as judged by the production of brood capsules and scolices. I have examined many hundreds of cysts of the lung and liver of sheep, but have seen the formation of daughter cysts on only three occasions, once in the lung and twice in the liver. The cyst of the lung has already been referred to; in the case of the hepatic cysts both were close to bile ducts, but in only one was bile present macroscopically.

It should be borne in mind that these animals in the ordinary course of events are slaughtered at a comparatively early age which for sheep averages from two to two and a half years. The cysts are smaller and the adventitia is much thicker and therefore the tendency to involve natural channels is much less than in man. In animals which are slaughtered when older, such as oxen, horses and older sheep, daughter cyst formation does occur much more frequently, although it is at present impossible to obtain exact comparative figures on

this point.

The Effect of Puncture.

In the past exploratory puncture followed by evacuation of as much of the fluid of the cyst as possible was a recognized method of diagnosis and treatment. It is for various reasons rarely practised now and for observations on its effects we are mainly dependent on the older records. It was soon noticed that not only was the proceeding dangerous, but that it did not always lead to death of the parasite and cure. Thomas⁽¹²⁾ gives the accompanying table of the results of tapping:

Results of Tapping.

	Hopaice of	1 abbuild.	
Deaths	. 18.88%	Relieved	14.51%
Not relieved	. 0.99%	Reported cured	39.56%
Unsuccessful puncture followed by		midden out In 2	of office
operation			vralitar-
Total failure of method	f . 45.91%	Total success method	of 54.07%

The deaths in this series were apparently due to various causes such as entry of fluid into a bronchus,

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sepsis following the introduction of organisms, anaphylactic shock following rupture of the cyst or entry of bile and secondary suppuration. Unsuccessful puncture probably meant that daughter cysts were present, so that evacuation of anything like the whole of the fluid content was impossible. The reported cured cases amounted to 39%, but this is probably much too high. In small pulmonary cysts, provided that due regard be given to the risks, the method may be of value. In these cases the sudden release of intracystic pressure causes collapse and tearing of the mother cyst and if a bronchus is eroded or in close proximity to the cyst wall fluid may burst its way through into it, This is more likely to happen if the patient coughs, if there is a valvular opening or if the needle is of so fine a bore that the fluid is not removed quickly enough. In the case of small cysts the fluid may be readily expelled, but in large cysts there is a grave danger of asphyxia. Later the remnants of the mother cyst may be evacuated through the rupture with or without disintegration and with or without suppuration.

In the liver puncture would lead to lowering of intracystic tension, collapse of the cyst and the entry of serum from the congested adventitia now released from the pressure of the cyst. In some cases there would be entry of blood or bile. Many observers noted a rise in the protein content of the fluid of the cyst on a second tapping and the tendency for it to be turbid or bile-stained. The alteration in the composition of the fluid naturally led either to death of the parasite with consequent absorption of fluid and cure by fibrosis, to infection and suppuration or to reaction on the part of the parasite with the formation of daughter cysts.

Recurrence many years after tapping has been noted by many writers. The celebrated Jonathan Hutchinson recorded a case in England. The patient was tapped by him for a liver cyst and returned to the country apparently cured. Eleven years later he returned with a large cystic swelling of the abdomen and stated that it had been steadily increasing in size for some years. Operation revealed a large number of intraabdominal hydatid cysts. Many similar cases can be found in the records both in Australia and abroad. The following is an instructive history of a patient admitted to the Melbourne Hospital recently:

The patient, a female aged thirty-five, stated that nine years previously she had had a hydatid cyst of the left side of the upper part of the abdomen tapped in another State with apparently good results. Latterly she had noticed vague abdominal discomfort and had had one attack of severe abdominal pain with vomiting. On examination she had a small scar at the site of the old tapping and a moveable non-tender tumour below and to the left of the umbilicus. The left lobe of the liver was enlarged up to the fifth interspace in the anterior axillary line. The result of the hydatid complement fixation test was "P + + +" and that of the Casoni test positive. The diagnosis of recurrent hepatic hydatid with omental hydatid was made. She was operated upon by Mr. Kilvington who found numerous omental hydatids and a large cyst in the pelvis attached to the uterus and the Fallopian tubes. The left lobe of the

liver was also occupied by a large cyst. Many of the cysts in the omentum were small, calcified and degenerated. All cysts containing fluid except the liver cyst were removed or evacuated. At a later operation this was opened, evacuated and closed without drainage. This cyst was found to contain turbid fluid although there was no evidence of actual suppuration and many daughter cysts, some of which were normal, while many were collapsed and degenerated.

There are several important features in this case. The apparent cure after a single tapping was no doubt due to the evacuation of a simple cyst with disappearance of the tumour. The tapping at the same time set free into the peritoneal cavity active hydatid elements some of which implanted themselves in the pelvis and omentum, while others became degenerated or calcified after growing for a short time. The original cyst collapsed and lost most of its fluid, but the germinal cells of the parasite remaining were able to react with the formation of daughter cysts. The older observers saw many similar cases and it is strange that the exact significance of the local as well as the general recurrence was not more accurately comprehended. Recurrence together with other factors such as mortality, complications and the difficulty of prognosis, have led surgeons to the conclusion that the blind tapping of hydatid cysts was dangerous, unscientific and entirely unreliable.

Immunological Evidence.

For some years past full investigations of various serological reactions have been carried out at the Walter and Eliza Hall Institute. The most important of these is the complement fixation test. This test depends upon the presence in the body fluids of a person suffering from hydatid disease of a specific antibody whose formation is induced by the absorption of specific hydatid protein. This antibody in the presence of specific antigen combines with complement and the latter cannot then be detected by means of a sensitized system consisting of red blood cells and specific hæmolysis. The test is made quantitative and probably gives a fair indication of the amount of antigen that has been recently absorbed. While correlating the results of serological tests with the pathological findings, I was struck by the association of high complement fixation with the presence of daughter cysts. Thus out of a series of twenty-four cases characterized by daughter cyst formation a complement fixation was obtained in twenty-one. It was also found that while a definite proportion of simple cysts failed to give a reaction, any complication such as rupture or operative interference invariably raised the amount of complement fixed and in this type of case positive results were obtained in practically 100%. (14) It was noted in cases in children in whom daughter cyst formation is very rare, that absence of reaction was the rule. This association of a high percentage of positive results with complement fixation tests and the presence of daughter cysts appeared so constantly that the logical inference was that both were due to the same cause, that is some interference with the original cyst which led to an increased absorption

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of antigen and in many cases stimulated the formation of daughter cysts. The exceptions to this rule were no doubt due to the lapse of sufficient time since the absorption of the antigen for it practically to disappear from the blood. This relationship between daughter cyst formation and the nature of the immunity reaction led to the present investigation.

Application to Clinical Medicine.

The above observations and a study of daughter cyst formation lead me to emphasize the following points:

1. The occurrence of daughter cysts in hydatid disease means that there has been some complication to the cyst and it follows that the pathology, the symptomology, the subsequent history and the methods of treatment will be modified.

2. The prognosis in these cases is much worse and much more uncertain than in simple cysts.

3. Hydatid germinal membrane has a remarkable persistence and power of growth, so that simple puncture of a simple cyst not only cannot be relied upon to cure, but may be followed by recurrence and secondary sowing of cysts.

4. All hydatid cysts should be operated upon as soon as they are diagnosed, as they are all potentially dangerous and the longer they are left, the more likely are complications to occur. In this connexion it is well to bear in mind that the majority of adults are infected in childhood and that every attempt should be made to diagnose the condition as early as possible while the cyst is

5. The treatment of simple cysts by the French method of "Formalin" injection before opening rests on a sure foundation, but the method is much less rational in cases containing daughter cysts. laminated membrane of these cysts is relatively impermeable and fixation of their protoplasm takes a long time. As a postoperative measure "Formalin" treatment of the sac may be likened to locking the stable door after the escape of the horse, although it may have a limited application in certain cases in which brood capsules have been spilt. For this purpose alcohol would appear to be an equally effective fixative and would be much less toxic to the host

6. In the treatment of hydatid of the liver any cyst containing daughter cysts should be suspect because of the practical certainty of previous biliary contamination. After the release of the pressure on the adventitia bile ducts often open into the cavity with the possibility of an external biliary fistula or intraperitoneal leak. same reason infection of the cavity is liable to occur, hence the wisdom of completely closing all cysts is extremely doubtful. Each case should be judged on its merits from the pathological aspect and, if there is any suspicion, drainage should be used. Owing to the irregular nature of the cavity in many cases, to the thickness of the adventitia and the difficulty of complete evacuation suppuration and drainage tend to be somewhat prolonged. Another risk in hepatic cysts of this type is the invasion of the biliary channels and the passage of daughter cysts or pieces of hydatid membrane through the ducts with almost exact simulation of gall stone colic. Infection of the biliary channels with resultant cholangitis may also occur.

7. The presence of omental hydatids, especially if they are multiple, should at once lead to an examination of pelvis and of the liver. In the latter the original cyst which may have given rise to the secondary cysts, should be carefully looked for and all scars and depressions explored. In all these cases a history of previous abdominal pain should be sought.

8. Whenever an intrathoracic cyst is found to contain daughter cysts an hepatic origin should be suspected and this should lead to an investigation of the diaphragmatic region.

Summary.

All the evidence, biological, clinical, immunological and pathological that can be obtained, leads to the belief that daughter cyst formation in hydatid disease is due to some interference with the normal development of the parasite. The phenomenon is atypical and must be regarded as an expression of the activity of the germinal cells of the parasite which, when they find their vitality menaced and the continued production of scolices impossible, react in this way, the reaction being a purely defensive one to insure the carrying on of the species.

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HYDATIDS OF THE LUNG.

By Fren D. Bird, C.B., M.B., M.S. (Melbourne), Honorary F.R.C.S. (Eng.), Honorary Consulting Surgeon, Melbourne Hospital, Melbourne. .

SEVERAL friends have asked me to give my views on pulmonary hydatid diseases. The points that seem to be of greatest consequence are these.

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The live hydatid has a very different importance, diagnosis and treatment from the dead cyst. After its actual existence in the lung the most salient fact in the history of the echinococcus is that it ruptures sooner or later. Obsolescence may occur, but it is uncommon.

Rupture usually precedes suppuration (the opposite to what obtains in hepatic cases) and generally takes place into a bronchial tube of a size greater than that into which a liver cyst opens through the diaphragm. The cyst may, however, rarely burst into the pericardium or into the pleura, but the invasion of the pleural cavity is generally accomplished after a first rupture has been made into a bronchus and it is a fatal accident, as the serous cavity has suddenly presented to its large absorbing surface a massive dose of decaying human and echinococcal refuse. Several such cataclysms have been seen and smelt by me and in spite of very free opening and oxygen lavage et cetera the patients have sweated through sepsis to a miserable death. The stench of such patients is appalling and comparable to the fearful fætidness found in the cavities associated with miner's phthisis.

There is a rupture in this regard which forms the most dramatic crisis in diseases. The advancing growth of the cyst which generally has the most tenuous of adventitiæ, causes to be absorbed the wall of a large pulmonary vessel at one tangential point of the cyst. So hermetic is the apposition, that the blood current uses the outer aspect of the cyst as naturally as the intima of its own blood vessel.

A sudden cough, a blow or a strain destroys the perfection of the placing and blood walls around the cyst. A bronchus of some size has probably an opening on to the cyst so that the main bronchi are soon flooded. Death ensues.

It has been my good fortune not to see this tragedy, but I know of two undoubted cases occurring at operation many years ago. It is a very rare accident, but its possibility is present in every case. Whenever I operated on a patient with pulmonary hydatid unruptured, the relatives were informed of the remote chance of a tragic ending which no foresight or treatment could avert.

A pulmonary cyst as a rule produces so little reaction that but slight adventitious material is formed around it.

That the lung can produce a tough and thick adventitia is not to be doubted, that it usually does not so produce is also not to be doubted. In a similar way that the pulmonary cyst can produce daughter cysts in abundance is undeniable, that it generally does not is also undeniable.

These points affect in the strongest way the technique of treatment of any given cyst unruptured at the time of operation and the duration of convalescence. Operation is of course the only treatment

Why some few should have thick human overcoats and some have many children, while their fellows have no overcoats and no children has never been discovered. The overcoat and the children seem connected in the individual cyst.

The position of the cyst has much of importance for the surgeon, indicating his line of attack. The factors governing the deposition of the hydatid element seem to be such as to conduct it generally to the periphery of the organ, as in the liver and in addition even in the roomiest thorax the cyst in its growth must soon impinge on the circumference of the barrel of the chest or nearly approach the confines.

As a general rule the cyst avoids the apex of the lung and its diaphragmatic aspect, so its globularity tends to touch the chest wall in the mid-axillary line about the fourth rib. Of course this is not universal. Nevertheless I am willing to assert that many more decent sized cysts can be attacked with advantage from this position than from any other seat of election. I have seen cysts at the level of the clavicle and cysts low down towards the diaphragm, when the fluorescent screen makes a startling diagnosis between such a cyst and an intraabdominal one. I believe it is true that small cysts occur at times near the root of the lung, that these are apt to have daughter cysts and thickish adventitiæ, that they burst and a cure results naturally after a long period during which the physical signs are embarrassing to the physician. However, the diagnosis of unruptured cyst in the lung is easy nowadays in all but a very few cases. The salt laden fluid of an unruptured cyst shows darkly on the screen. The shadow is that of a rounded ball, but there may be aberrations from the perfect circle at parts of the circumference. A dark ball on a light ground makes a most intriguing picture on the screen or photographic film. When the cysts are multiple, the presentment is engrossing. combinations I have seen include one cyst in each lung, two in one lung and one in the other and on one occasion there were three dark balls, one above the other in the right lung, resembling exactly half the coat of arms of the Medici family. On one occasion when I could not understand the shadow of the fair sized cyst being so far away from the peripheral place I thought its size should seek, I found to my great interest and embarrassment that the cyst had come to the surface in the interlobar cleft and not at the rib circumference. It had fulfilled what I though its wandering duty, but not at the spot I expected. In this case I had to remove pieces of three ribs in the mid-axillary line to evacuate the cyst which was childless and had no Most of the fluid was sucked away through a long trocar and the lower aspect of the upper lobe had to be kept out of the way with a The cyst was easily removed and I spatula. allowed the anæsthetist to produce a deeper anæsthesia than that on which I usually insisted. No collapse of the lung occurred and but little fluid could have entered the pleural cavity. A complete cure followed.

The symptoms of hydatid of the lung are few until rupture occurs, some dyspnœa showing itself as bouts of breathlessness and later some pain and em

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discomfort. Gross pleuritic pain and effusion do not occur. Pleural effusion is common with cysts on the upper surface of the liver and is often in considerable quantity, not so with pulmonary cysts—the dyspnœa varies, being constant with a large hepatic cyst in diaphragmatic contact, but tending towards attacks in pulmonary cases.

With the fluorescent screen there seems but little need for the complement test and skin reactions in the diagnosis of unruptured pulmonary cysts. Aneurysm will, however, occasionally cause confusion on the screen and here these tests will be of the first importance. In the neck and limbs hydatid cysts affect the neighbourhood of the great vessels, but only occasionally will a pulmonary cyst be seen in such vicinity as to suggest aneurysm. It is the other way on and a sacculated aneurysm may rarely suggest the presence of a hydatid. Syphilomatous deposits occur sometimes in the lung and give rise to strange pictures on the screen. They are cloudy developments rather than definite outlines, but as they are more opaque towards their centre, the suspicion of hydatid may arise. When the rupture comes, as come it will in nearly all cases, the symptoms are exclusively echinococcal. The hydatid's abode, the patient's bronchial tubes and trachea, nasopharynx, mouth and nose are flooded with salt water, even to the drowning of the host. Again a fatal result has been known to occur through the blocking of the main bronchus on the affected side by a mass of echinococcal membrane and this terrible possibility may materialize at a later date than the time of actual rupture. Thus apart from long drawn out sepsis the life history of pulmonary hydatid, differing from the less eventful tale of its hepatic brother, demands early operation in all cases, where the cyst is not insignificant in size and inaccessible as regards position. Such a cyst is but rarely seen.

The operative technique that I have pursued in cases of unruptured cysts with complete success, is this. A fluoroscopic examination, back and front and partially lateral, is made and the fourth rib is generally seen to be the neighbourhood to choose if a cyst has attained any size, as is probable. In the same way the mid-axillary line is usually the most suitable spot for incision, but the piece of rib may be removed somewhat in front of or behind this according to the fluoroscopic findings. No sewing together of pleural surfaces is necessary or advisable. In fact such apposition is inadvisable. It takes time and a larger incision, it pulls the parts about, it leaves foreign bodies in the wound, the stitches are liable to be pulled out in the subsequent manipulations and patients do perfectly well without such stitches. If the cyst is immediately beneath, as usually obtains, it can be felt with one finger as much more resistant than lung would be, a large knife is thrust in the line of the rib through the tissues into the cyst, the left forefinger at once follows into the cavity of the cyst, which is pulled up into the space left by the removal of the rib.

If the surgeon is not satisfied as to the absolute propinquity of the cyst, a small trocar may be

inserted, which is at once followed by free opening with the knife, if fluid is discovered. A small layer of lung between the surgeon's finger and the cyst is of no moment surgically. The general anæsthesia is kept purposely light and the patient coughs up some fluid, but nearly all of it passes over the surgeon's finger into the outer air. Strangely enough I have never performed this operation with local anæsthesia, but it is perfectly permissible, although there are anaphylactic possibilities. The surgeon is aware whether there is an adventitia or not as he holds the tissues. Still holding with the left forefinger and thumb he removes the cyst wall with an ovum forceps. If it is delicately manœuvred the cyst will largely deliver itself, being urged outwards by the resilient lung. Thus the former site of the hydatid is more or less, generally more occupied by the expansion of pulmonary tissue. No bleeding occurs. If the adventitia is absent or negligible in its tenuity, the wound is sewn up with deep sutures including the skin, the operation being thus concluded. Silkworm gut sutures are used and swabbed with iodine before removal. I beg to affirm about this operation that it has a high simplicity and a low mortality, the latter represented by that rare tragedy, where a pulmonary vessel has been opened in the natural history of the hydatid. In cases in which the surgeon's finger, drawing the cyst wall up into the wound, tells him that there is more tissue than hardly palpable lung, he should investigate further. A definite thickening of tissue which keeps the cavity where the cyst was from filling up almost entirely, demands a short tube for forty-eight hours. If the unusual phenomenon of a thick adventitia be present, two or three stitches through it and the pleura to the intercostal muscles are advisable and the tube should be retained with shortening lengths until obliteration occurs.

Thus an unruptured pulmonary hydatid cyst can usually be removed in a very few minutes with no bleeding, no danger and a confinement to bed of but three or four days. During these days a fluoroscopic examination shows a haziness where the cyst was which very soon disperses entirely.

The diagnosis, treatment and the course and effect of the disease upon the patient's health are entirely different in those cases of pulmonary hydatid in which the cyst has already ruptured, from the simple diagnosis treatment and course of the unruptured cyst. The latter has no or little effect on the patient's health.

In attaining diagnosis tuberculosis and actinomycosis each under the banner of sepsis have to be eliminated and if an echinococcal origin is assumed, a
differentiated decision between hepatic and pulmonary site has to be made. Bronchiectasis in some
cases looms on the diagnostic horizon as a possibility. In these cases which should be few, the help
of two friends wavers a good deal. The former
decisiveness of the fluorescent screen fails much and
pictures of all degrees of indefiniteness replace the
wonderful personality of the shadow of the unruptured cyst. However this varying vagueness helps
us, as screen effects may vary from day to day in a
way which obtains with no other disease, but to base

a diagnosis on a single appearance on the screen is to court diagnostic error. It seemed to me and fellow workers with me that the alteration in appearances which was undoubted, was due to the moving of the remnants of the sodden cyst wall. Alteration could be observed sometimes after the patient was made to cough. I admit that the pictures are vague, but careful observation will reveal the truth of what I say.

Microscopical examination of the sputum especially for hydatid elements and bile pigment is of course a routine exercise.

Casoni's test errs on the side of being too good in some cases. It will proclaim with much colour and certainty that a person is echinococcically affected, but alas it goes on proclaiming it at every experiment in what is sometimes a bewildering fashion. There is also the complement deviation test. All these tests may be useful, but a survey of the diseases which are not present in any individual case, may be the greatest diagnostic

The history in some cases is all important, the suffusion of the air passages with salty fluid, the spitting up of so-called grape skins being absolute evidence, but the patient's memory and intelligence are often at fault on these points.

The varying degrees of sepsis present are shared by other diseases, but very early and deep sepsis is suggestive of the cause being originally echinococcal.

Retroperitoneal hydatid cysts are much more common than cysts occupying a similar position as regards the pleura. The latter are called subserous cysts though some would be better named mediastinal. They are rare. They are usually seen in the vertebral region and posteriorly may present between the ribs. When such appearance occurs, a mistake is born at the same time, for the bulge takes place in the vicinity of the rhomboid muscles, a common position for muscular hydatids. The surgeon thinks it a simple case, but his incision may lead his finger between the ribs into the depths of the chest, with more than one cyst to remove. Thus bulgings in the neighbourhood of the rhomboids should be treated according to their large possibilities. Mediastinal cases properly so called are best spoken of in connexion with pericardial and cardiac cysts.

There was one instance in my experience which has been a source of wonderment to me for many years. Dr. Melrose Mailer called me in to see a patient suffering from pleurisy with effusion. The chest was dull on percussion from the liver to the clavicle. I tapped and we were astonished to find colourless fluid come out, to the extent of many pints. We gave the patient morphine and kept him very quiet and watched most of the day with him. After some hours he began to spit up fluid of the same character. He eventually got quite well after expectorating grape skins for a year and more. How was it possible that so huge a hydatid avoided rupture? It was not hepatic in origin and apparently was pulmonary. It gave us much food for thought.

Reports of Cases.

PREANÆMIC COMBINED DEGENERATION OF THE CORD.

By WILFRED EVANS, M.B. (Sydney),

Honorary Assistant Physician, Sydney Hospital, Sydney; Honorary Assistant Physician, Royal Alexandra Hospital for Children, Sydney.

Clinical History.

T. DE V., a male, aged fifty-one years, was admitted to hospital on March 27, 1925, complaining of "pins and needles in the tips of his fingers for three months." This was followed later by a tingling sensation extending from the feet to the calves of the legs. He also complained of progressive muscular weakness. At times he had suffered from a sore tongue and was acutely sensitive to cold. A very definite intractable balanitis and pruritus had caused him much inconvenience and were noticed some weeks prior to the onset of his other symptoms.

some weeks prior to the onset of his other symptoms. This recalls very strongly the case of a patient with sprue shown here by Dr. Furber some weeks ago. In Dr. Furber's patient the underlying cause (deficiency of hydrochloric acid) appears to be the same.

On examination the cardiac, respiratory and urinary systems presented no organic changes. In the alimentary system the only definite feature on admission was the tongue which was reddened and glazed in appearance and some patches of ulceration were present on the floor of the mouth.

Mental functions and cranial nerves were normal. The

Mental functions and cranial nerves were normal. The pupils were equal and reacted to light and accommodation. The plantar reflexes were flexor in type. The knee jerks were present but sluggish.

There is no definite muscular wasting, but pronounced

incoordination and Rombergism are present.

Sensation in regard to light touch, temperature varia-tions and painful stimuli is unimpaired in all areas. The chief alteration occurs in the tracts carried by the pos-terior columns; sense of position, recognition of size, shape and form, appreciation of weight and vibration sense are all very much diminished.

The blood count on admission yielded the following result:

Red cells 4,390,000 per cubic millimetre. Hæmoglobin value, 80%.

Colour index. 0.91.

Leucocytes, 9,000 per cubic millimetre (neutrophile cells 64%, lymphocytes 25%).

Definite anisocytosis was present, the majority of the cells being macrocytes; diffuse polychromasia was present. No polkilocytosis or erythroblasts were seen.

At a later count the erythrocytes numbered 3,800,000 per cubic millimetre and colour index was 1.03. A fractional test meal revealed complete absence of free hydrochloric acid. The serum failed to react to the Wassermann test.

Van den Bergh's test was carried out. No response was obtained by the direct method, but a reaction was obtained

with the indirect method.

Streptococci after several tests were isolated from the duodenum, but were not definitely proved to be hæmolytic.

Comment.

The absence of free hydrochloric acid in the gastric juice, the response to the Van den Bergh test, the presence of numerous macrocytes and anisocytosis comparatively high colour index in conjunction with the changes in the posterior columns of the cord seem to establish the diagnosis of preanemic combined degeneration.

The only other possibility appears to be tabes dorsalis and the presence of knee jerks and active pupil reflexes and the failure to react to the Wassermann test with such definite cord changes are strongly against this diag-

¹ Read at a meeting of the Sydney Hospital Clinical Society on July 9, 1925.

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nosis. The patient has been treated with large doses of free hydrochloric acid and has very definitely improved both as regards his muscular sense and power of walking. An interesting fact is that the patient's sister has had a fractional test meal done and this reveals complete absence of hydrochloric acid.

Acknowledgement.

In conclusion I wish to acknowledge the kind assistance given me in establishing the diagnosis by Dr. Holmes a Court.

CÆSAREAN SECTION ON ACCOUNT OF IMPERFORATE ANUS WITH THE RECTUM DISCHARGING INTO VAGINAL FOURCHETTE.³

By P. L. HIPSLEY, M.D., Ch.M. (Sydney), Honorary Surgeon, Royal Alexandra Hospital for Children, Camperdown, Sydney; Honorary Assistant Surgeon, Royal Hospital for Women, Paddington, Sydney.

Clinical History.

A woman, aged thirty-three years, was admitted to the Royal Hospital for Women, Paddington, on June 23, 1925.

She was a primipara and had had no miscarriages. The pelvic measurements were: Interspinous diameter, 22.5 centimetres (nine inches); intercristal diameter, 24.3 centimetres (nine and threequarter inches); external conjugate diameter, 18.75 centimetres (seven and a half The transverse inches). diameter of the outlet was ten centimetres (four inches). On making an examination it was found that the anus was imperforate and that the rectum discharged into the vaginal fourchette. The condition is well illustrated in the accompanying reproduction of a drawing made for me by Dr. Ewan Murray Will. The patient had been in labour for several hours and the head which was presenting, was not yet fixed. On passing the finger into the rectum there was found to be complete absence of sphincteric control, but the levator ani seemed to exercise a moderate amount of control. The patient stated that she suffered very little inconvenience from the malformation. She had control "provided the bowels were not loose." Partly on account of the non-fixation of the head, but mainly owing to the fact that I considered that the passage of the fœtus vias naturales would certainly result in such overstretching of the levator ani

that complete lack of control of the bowels would almost certainly follow, I decided to deliver the patient by Cæsarean section. This was done by the usual transperitoneal method.

Comment.

I have seen several conditions similar to this in infants and have seen the patients operated on in an attempt to restore the parts to a more or less normal condition. The results, however, have been far from satisfactory and I report this case to show that the levator and may exercise sufficient control to make one hesitate before advising operation for infants on account of this condition.

Reviews.

BILHARZIA

Dr. F. Gordon Cawston, of South Africa, has republished in booklet form an article entitled "Bilharzia"—which appeared in The Journal of Tropical Medicine and Hygiene.¹

It is a shock to Australian vanity to find no mention of N. H. Fairley even when complement fixation is discussed at some length, but no other authorities are named except Christopherson.

The author discusses only Bilharzia hæmatobia; Bilharzia mansoni is never mentioned; in fact no specific name is used at all. The snail Physopsis is the usual intermediate host in South Africa apparently as opposed to the Bullinus of Egypt—as Fairley suspected in 1919. The account

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Drawing of Imperforate Anus with the Rectum discharging into Vaginal Fourchette.

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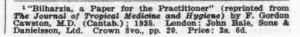
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of Egypt—as Fairley suspected in 1919. The account of the life history of the parasite is not very clearly put and the clinical symptoms are not divided as Fairley did into the general toxem and the local inflammatory. He insists very properly on the mildness of these symptoms in many cases, a stain or trace of blood, a little frequency of micturition or slight albuminuria, but he also describes the more severe symptoms such as severe hæmaturia, renal colic and even epileptiform fits. He makes no mention of the value of cystoscopy in diagnosis, but describes the frequent eosinonhilia.

His account of treatment is clear and detailed, but he does not say that Christopherson considers 1.8 grammes (thirty grains) of tartar emetic to be the full course necessary in some instances. He speaks of emetine used intramuscularly. N. H. Fairley has used it in goats infected with an allied worm and claims 100% cures as against only 60% for antimony. He points out—a statement confirmed by Christopherson—t hat emetine causes cardiac depression and neuritis and is a less safe drug than antimony.

The signs of cure are: (i.)
Relief of symptoms; (ii.)
alteration, diminution and

finally disappearance of ova from the urine; (iii.) failure of the serum to react in the complement deviation test.



¹Read at a meeting of the New South Wales Branch of the British Medical Association on July 9, 1925.

He emphasizes the dangers and upsets, for example collapse, renal colic and local inflammation.

The little book is easy to read and may be as the author says "for the practitioner," but the omission of so much important matter greatly diminishes its value.

THE MIND.

The interesting book by Dr. Francis X. Dercum, entitled "The Physiology of Mind," is primarily concerned with a description of the evolution of the physical basis of nervous and mental phenomena and with an explanation of the reception, transmission and release of nervous energy in the higher vertebrates, particularly in man.1 It commences with a consideration of the forms of energy which protoplasm is capable of receiving, the conversion of these incident forces into other forms and the transmission of impacts and their resulting expression in motion, locomotion and other functions are fully discussed. It is shown that in the most primitive living organisms responses to impacts are very general in character, that as evolution proceeds they become at first limited and special, that with advancing differentiation they become fixed, stereotyped and invariable. Finally owing to the vast development of the number of the elements and their complicated arrangement in the Neo-pallium-especially in man-the responses lose the quality of fixation and become increasingly the approximate equivalents of the impacts. In popular language this is described as a greater facility for adjustment to the environment.

In the discussion which follows, the chapters on the "Field of Consciousness" on the "Rôle of the Thalamus" and on "Speech," including the functions of the corpus strictum are of special merit.

Following a convincing chapter on the electric transmission of nervous energy the author inevitably finds himself confronted with the age long problem of mind and consciousness. In an endeavour to overcome it he appeals to Einstein's theory which assumes matter to be motion or motion to be matter, to the facts of radio-activity and to the recent discovery of the electrical structure of atoms. He argues that the problem of the world of non-living things cannot differ from that of the world of living things and he asks: "Is not the difference between material and immaterial thereby dispelled and is a dual conception of the Universe any longer necessary?" The answer to these questions will depend upon the idiosyncrasies and preconceptions of his various readers.

An addendum to the volume is devoted to the pathological physiology of mind wherein the mechanisms of the principal neuroses and psychoses are suggestively discussed. The appendix contains an uncompromising and scathing criticism of the teaching and methods of the Freudian School. Like all Dr. Dercum's writings this is a thoughtful book filled with much accumulated knowledge which the author has applied with judgement and clearness.

MAPS OF THE BRAIN.

Dr. C. U. Ariens Kappers has recently edited a series of nine coloured maps with descriptive text, illustrating the comparative anatomy of the vertebrate brain, more especially of the nerve fibre systems and nerve centres. These remarkable diagrams or maps are coloured, various groups of tracts being indicated by different colours. For

example, black is used to indicate the motor systems, orange for sensory root fibres and blue indicates secondary, tertiary and commisural systems of olfactory or prevailing olfactory character. The whole tract system and nuclei are projected on to the sagittal plane. The brains which are taken to form a representative series, are those of Amphioxus, Petromyzon, Scyllium (shark), Rana (frog), Varanus (lizard), Onychogale (marsupial) and man.

Besides these seven maps, two further maps of the more aberrant brains in the vertebrate series complete the series, for example, one of a bony fish (*Periophthalmus*) and one of a bird (*Gallus*).

Though consisting of but thirty large quarto pages, the descriptive text will be found to be remarkably full and incorporates much of the most recent work, not only upon the comparative anatomy of the vertebrate brain, but also upon that of man. For instance, reference is made to Brouwer's statement that the pulvinar of the so called optic thalamus probably receives no direct fibres from the optic tract at all. The short summary of the connexions of the thalamus and corpus striatum in each animal is especially interesting.

It might be thought that the projection of all the important fibre tracts on to one map would lead to confusion, but this has been avoided very skilfully and is of course aided by the large wall-diagram size of the maps (eighty by one hundred and ten centimetres). Australians will be interested to note that the work of Elliot Smith on the marsupial fornix, on the vertebrate corpus striatum et cetera has been fully incorporated as well as that of the late John Irvine Hunter on the brain of the kiwi. The kiwi is unique among birds in being macrosmatic. Hence it forms a link which allows us to bridge the often difficult gap between the normal microsmatic bird brain and the reptillan brain.

This series of maps is quite unique and will prove to be of value not only to students of comparative neurology, but also to the clinical neurologist.

The final map of *Homo* is somewhat larger than the remainder of the series and gives a remarkably clear summary of not only the main fibre tracts, but also of many of the lesser known tracts. The fact that the series come from the Central Institute for Brain Research in Amsterdam and that they are edited by Dr. C. U. Ariëns Kappers is a sufficient voucher for their accuracy.

OPERATIVE SURGERY.

Dr. J. S. Horsley's book on operative surgery covers the whole field of surgery and yet it is a volume of under eight hundred pages. Obviously Dr. Horsley has been forced to select what he considers the most likely operation to succeed under certain conditions and he has selected many new modifications of old technique. There is thus a personal touch throughout the book which makes it most readable. Of course a book of this size cannot be complete, but it is surprising to find the number of subjects with which the author deals. It is a book for the practising surgeon rather than for the general practitioner or student and indeed some of the subjects dealt with have hardly yet come into the scope of practical surgery. Such are excision of the head of the pancreas, removal of pulmonary embolism, division of valves in mitral stenosis; but these add a piquancy to the more practical subjects.

Except for the first chapter on "General Considerations" which is a most excellent one, every page is devoted to operative technique. One perhaps feels that an unnecesary number of books on general surgery are published annually. They are mostly ponderous, much resemble one another, are expensive and soon go out of date in some particulars. This book, however, is smaller and even if its value is not lasting, it is well worth reading now.

¹ 'The Physiology of the Mind: An Interpretation Based on Biological, Morphological, Physical and Chemical Considerations," by Francis X. Dercum, A.M., M.D., Ph.D. Second Edition, Reset. 1925. Philadelphia and London: W. B. Saunders Company. Post 8vo., pp. 287. Price: 17s. 6d.

² "Tabulae Anatomomo-Comparative Cerebri: A Series of Nine Coloured Maps with Description," Edited by Dr. C. U. Arlëns Kappers, Director of the Central Institute for Brain Research, Amsterdam. Amsterdam: The "Kosmos" Publishing Company. Royal 8vo., pp. 30.

¹ "Operative Surgery," by J. Shelton Horsley, M.D., F.A.C.S., Second Edition; 1924. St. Louis: The C. V. Mosby Company. Crown 8vo., pp. 784, with 666 original illustrations. Price: \$12.50.

The Medical Journal of Australia

SATURDAY, OCTOBER 24, 1925.

The Brotherhood of Wedicine.

TRAGEDY and adversity stir the tenderest feelings of man. When a heart ceases to beat, when circumstances compel a man to admit defeat in the fierce struggle for existence, when fate robs a home of its breadwinner, compassion is aroused and helping hands are extended. There is a freemasonry among all classes of human beings. At times its awakening is surprising, but even when it is aroused in unexpected circles, its precious character is unchallengeable. Human nature asserts itself in glowing colours when sympathy is excited and when brotherly love is stirred. The medical profession lays claim that it is at once a liberal and a humane calling. It has the tradition of kindness and ever ready sympathy. Little wonder that in each corner of this great Empire the medical profession has organized some fund or institution established for practitioners or their relatives who are in distress. That the majority of the benevolent funds of the medical profession are but small undertakings, poorly endowed, is due to the fact that the call on the members is usually made in a collective way and not for a specific purpose. A tragedy has overtaken a member of the medical profession and we wish to make the call on behalf of those he has left in straitened circumstances. An individual call will, we know, meet with a ready response.

On August 29, 1925, Dr. C. St. Leger Willis, a young Sydney graduate, received a call to visit a patient a few miles from his home at Bonalbo, in the Richmond River district. He rode to his patient and rendered the aid required of him in his usual kindly and helpful way. He left his patient's house happy in having been of service to his fellowman and rode away into the gloom. His wife awaited his return. Hours passed, but he did not appear. What happened on that calamitous ride can only

be surmised. When a search was made, he was found dead on the road. His face was terribly lacerated and injured. His horse was found at some distance with a bough transfixing its chest. It too was dead.

Dr. St. Leger Willis leaves a widow and five young children. Although a successful practitioner, he had not been able to accumulate a substantial sum to provide for those he has left. Some friends have brought the circumstances to the notice of the New South Wales Medical Benevolent Fund and temporary assistance has been rendered. Unfortunately the accumulated fund is small-too small to enable the Trustees to assist in an adequate manner those who have sought its aid. The British Medical Association has no power to collect moneys or to utilize its funds for medical benevolent purposes. The Council of the New South Wales Branch therefore has been in communication with the Trustees and has resolved to invite its members to send contributions in order that the fund may at least bear the cost of the education of the five children of the late Dr. St. Leger Willis. This fund, like the others, is in need of more generous support than it has received in the past. But our appeal at the present moment is for earmarked contributions. An annual sum of about two hundred pounds is required. It is little enough. Trustees of benevolent funds as a rule wisely refrain from disbursing capital. In this instance it would be advisable to utilize every penny that is given in aid of the widow of our deceased colleague and her children and not to attempt to provide a dole out of the interest of invested money. We should therefore suggest that those who read this appeal, forward to the Treasurer of the New South Wales Medical Benevolent Fund, Dr. E. S. Littlejohn, Croydon, New South Wales, an annual donation for a limited period to be used for the assistance of Mrs. C. St. Leger Willis. Should the amount contributed exceed what is required, it will be within the power of the donors to decide what may be done with the surplus. Those who give generously, will have the satisfaction of knowing that they can help to some extent to assuage the grief of one who has been robbed of a loving husband by a ghastly stroke of fate.

Current Comment.

SUBACUTE COMBINED DEGENERATION OF THE CORD.

THE case reported in this issue by Dr. Wilfred Evans as one of preanæmic combined degeneration of the cord will be of interest to both physicians and neurologists. It was owing to the studies of Putnam, Dana, Bastianelli, Risien Russell, Collier and Batten that primary combined degeneration of the spinal cord was first recognized as a clinical entity and its association with severe anæmia has made it a subject of the first importance. These observers pointed out that the dorsal and lateral columns of the cord were constantly involved chiefly in the thoracic and cervical regions. No changes were found in the nerve roots or grey matter. The relationship of the condition to anæmia was emphasized by Risien Russell, Collier and Batten when they defined three groups of affected persons. In the first group they placed individuals suffering from profound anæmia, manifesting no symptoms during life, but found post mortem to be the subjects of sclerosis of the cord. In the second group they placed persons suffering from pernicious anæmia with spinal symptoms and in the third group they included those suffering from chronic sclerosis of the spinal cord with severe anæmia as a secondary feature. It remained for Byron Bramwell and later A. F. Hurst and J. R. Bell in 1922 to show that the anæmia accompanying the spinal changes was of the Addisonian or pernicious type. Hurst and Bell reported eight cases of the disease and showed that achlorhydria of the gastric juice was present in each of the eight patients. The work of Hurst on pernicious anæmia, its accompanying achlorhydria and the presence in the duodenum of a hæmolytic streptococcus are well known and call for no explanation in this place. Hurst maintains that the division between primary combined degeneration and pernicious anæmia is purely artificial. He has recently studied the condition of the alimentary canal in twenty-four patients suffering from subacute combined degeneration of the cord and in thirty-four patients suffering from pernicious anæmia.1 Many of the patients in the latter group had symptoms or signs of organic nervous disease. Dr. Hurst describes his findings under several headings. In the first place complete achlorhydria was present in everyone of the thirtysix patients suffering from pernicious anæmia and in everyone of the twenty-four with combined degeneration of the cord. He points out that complete achlorhydria is present in the earliest as well as in the last stages of the disease and during remissions. It is found whether the anæmia or the nervous disease is present alone or whether the two are associated. It differs from the achlorhydria of cancer of the stomach and of pulmonary tuberculosis in being a predisposing cause and not a symptom. In the latter two conditions the development of achlorhydria can be watched as the disease gets

worse. In pernicious anæmia and in combined degeneration of the cord it is fully developed from the earliest moment of observation. Moreover, in these two conditions it is always complete. Dr. Hurst holds that the achlorhydria is generally due to constitutional achylia gastrica, an inborn error of functional activity independent of anatomical changes in the mucous membrane. Bennett and Ryle hold that 4% of normal individuals are thus affected. Dr. Hurst thinks that the familial occurrence of achylia gastrica must be the explanation of the familial occurrence of Addison's anæmia. Six of his series of thirty-six patients with pernicious anæmia had one or more relatives who had died of the disease. Four of twenty-four patients with degeneration of the cord had one or more relatives who had died of pernicious anæmia. One patient, a doctor, died of subacute degeneration of the cord, his father, his brother, his paternal uncle and paternal grandfather had all died of pernicious anæmia. Eight cases have been recorded in which the achylia gastrica was discovered before the onset of anæmia. The latent period varied from one to thirteen years. Wilkinson, of Melbourne, reported one case in which the interval was one year. It will be noted that in Dr. Evans's patient achylia gastrica was present and that in March, 1925, the erythrocytes numbered 4,390,000 per cubic millimetre. Dr. Evans does not say what interval of time elapsed between these two blood counts. It is evident from the history of Dr. Evans's patient that the nervous symptoms were the first abnormal manifestation. At the same time Dr. Hurst points out that secondary achylia gastrica, due to cancer of the stomach or even following the neuralization of gastric contents after gastro-enterostomy may be the precursor of pernicious anæmia.

In regard to the question of oral streptococcal infection Dr. Hurst points out that in the absence of the germicidal barrier formed by the free hydrochloric acid of the gastric juice, even a slight degree of oral sepsis becomes a danger. Pyorrhæa alveolaris is present in the majority of patients suffering from pernicious anæmia and combined degeneration of the cord. In the remainder he claims that he has always been able by "expert clinical and radiological examination" to discover the presence of definite periodontal infection, except when the patient was edentulous. Apparently removal of infected teeth in Dr. Hurst's experience is not sufficient to prevent the development of secondary infective foci. He claims that the teeth may not be removed early enough and quotes two cases to demonstrate this. Two patients had been edentulous for six months and five years respectively, but on radiological examination rarefying osteitis was found and long streptococci were discovered in the rarefied areas. Only second to the teeth in importance in Dr. Hurst's opinion is the tongue. In pernicious anæmia it is almost invariably the seat of chronic streptococcal inflammation. Furthermore he can see no reason why intestinal infection may not remain latent for years after the disappearance of the primary infective focus from the mouth. He thinks that food poisoning may so

¹ Brain, June, 1925.

affect the chemical environment of harmless streptococci that they will develope hæmolytic and neurotic properties. This is, of course, purely hypothetical. Dr. Hurst's statements and opinions cover almost every possibility in regard to oral sepsis. To the unbiassed reader they sound like special pleading and further experimental and clinical evidence must be produced before they can be accepted in their entirety.

Dr. Hurst gives some interesting figures in regard to the occurrence of the Streptococcus longus in the duodenum of sixteen of twenty-one patients with pernicious anæmia and of ten with combined degeneration of the cord. Five of the persons in the two groups who yielded no organism, had been given large doses of dilute hydrochloric acid. At the same time it was found in 20% of a group of one hundred and forty-five persons used as controls. Four of those were normal individuals and yielded no streptococci, eight with infective jaundice yielded no organisms and one hundred and thirty-three suffered from a variety of diseases. In conclusion Dr. Hurst refers to the reluctance of some authors to regard as Addisonian the anæmia accompanying combined degeneration of the cord. The work of Price Jones has shown that the increase in the average size of the red corpuscles is the essential characteristic feature of the blood picture. He illustrates his remarks by a typical "Price Jones curve" from a case of subacute combined degeneration of the cord. The ordinate represents diameters of the red cells and the abscissa the number of cells counted. The megalocytosis can then be shown graphically even in the absence of anæmia.

THE UTERINE SCAR AFTER CÆSAREAN SECTION.

Ir has often been noted that the scar in the uterus after Cæsarean section may disappear so completely that it becomes practically impossible to recognize its situation. Rupture in the site of an old incision is relatively rare and when it does occur, it is supposed to depend on the thinning of fibrous tissue which has formed after the healing by second intention of an infected wound. In some instances it is probable that the rupture takes place not through the line of the previous incision, but at a situation at some distance from it. It is assumed that the fibrous tissue formed as a result of an imperfectly closed wound, impairs the natural contractility and elasticity of the neighbouring muscular tissue and renders it more liable to become overstretched and thinned. The nature of the healing process after Cæsarean section is of more than mere academic interest, for on it must depend the ultimate condition of the uterine wall. If the wall is permanently damaged, more care should be exercised in the selection of the site of incision than if complete regeneration of the muscular tissue takes place. Opinions are divided on this point. Dr. Otto H. Schwarz and Dr. R. Paddock have published some important information on this matter. In the

first place they record the condition of the uterine scar in three women who died five days, five days and six days respectively after Cæsarean section. The approximation of the incised wound in the first woman was exceptionally good. There was little evidence of infection, for, although some cocci were found in an area of superficially degenerating tissue, the line of incision was free. The wound was gaping to a slight extent for the distance of about five millimetres. In this area the muscular tissue was necrotic and there was a leucocytic infiltration. Elsewhere the edges were in accurate apposition held together by a plug of fibrin. Many fibroblasts and some newly formed blood vessels were seen along the edges of the incision. The incision in the uterus of the second patient was found after death to be free from bacterial invasion. The muscular tissue around the wound was necrotic and there was considerable leucocytic infiltra-Very little fibroblastic reaction was detion. tected. The authors mention that the patient's condition had been much impaired, that the approximation of the edges was not exact and that there was excessive suturing of the wound. The wound in the third specimen was definitely infected. The evidence derived from these three uteri led them to study the healing in a series of pregnant guinea pigs which they subjected to abdominal hysterotomy. The animals were all at or near the full term. The operations were conducted with great care and the animals were sacrificed at periods varying from seventeen hours to ten weeks after the operation. In some there was a considerable reaction in the endometrium caused by a low grade infection. Drs. Schwarz and Paddock were satisfied that the healing in several guinea pigs was proceeding without infection. At an early stage there was a definite proliferation of fibroblasts and a formation of new blood vessels. This reaction took place not only along the line of incision, but penetrated between the muscle bundles in the neighbourhood. After from twelve to twentyfive days the scar was demonstrated by means of orcein-van Gieson staining. This aseptic scar then contracted and at the end of ten weeks the authors found it difficult to detect. difficulty was all the greater because the scar assumed the normal pattern of an uninjured uterine wall. But even at this stage they were able to demonstrate the fibrous tissue by means of van Gieson staining. They sought for signs of mitosis. None was discovered in the muscle cells. Some mitotic figures were seen in the connective tissue cells in areas of imperfect approximation and doubtful sterility. They are convinced that true muscular regeneration does not play an important part in the healing. They state that their experience indicates that necrosis and leucocytic infiltration are likely to occur if the edges are not accurately approximated and if the sutures are too tightly applied or are too numerous. If the wound gapes, the defect is likely to be filled with endometrial tissue. This causes the scar to be thin and imperfect. The illustrations in the article confirm the findings of the authors.

¹ American Journal of Obstetrics and Gynecology, August, 1925.

Abstracts from Current Wedical Literature.

PÆDIATRICS.

Dietary Treatment of Epilepsy.

M. G. Peterman (Journal of the American Medical Association, June 27, 1925) reports the treatment of thirty-seven children suffering from idiopathic epilepsy, by means of the high fat or ketogenic diet. Seven of the patients had grand mal, seventeen petit mal and thirteen both grand and petit mal. Their ages ranged from two and a quarter years to fourteen and a half. Care was taken to exclude those who had obvious organic disease of the central nervous system or evidence of mental deterioration. The ketogenic diet consists of a large amount of fat with minimal amounts of carbohydrate and protein. The object of the diet is to produce a ketosis as evidenced by acetone and diacetic acid in the urine. Every patient treated with the diet is given an individual prescription. The basal metabolic requirement is determined directly or calculated from the Du Bois normal standards. To allow for growth and energy 30% is added to the basal food requirements. This caloric allowance will depend on the age, weight and height of the patient. will approximate seventy-seven calories for each kilogram of body weight. Overweight patients are kept within their basal food requirements until their weight is reduced approxi-mately to normal. After a few days of gradual carbohydrate restriction fifty, forty or twenty grammes daily, with increasing allowances of fat, seventy, ninety or one hundred grammes daily, the patient is put on his individual prescription, which consists of ten to fifteen grammes of carbohydrate daily, one gramme of protein for each kilogram of body weight and sufficient fat to supply the remaining caloric requirement. Provision is made for the vitamins and salts. Water is allowed freely. The diet is well tolerated if started gradually. Shortly after acetone and diacetic acid appear in the urine there is usually a decrease or a complete cessation of the epileptic seizures. The occasional nausea and vomiting during the preliminary carbohydrate restriction is quickly relieved by orange juice. After the patients have been free from attacks for three or four months and ketonuria still persists, the diets are gradually modi-Changes are made according to the reaction of the individual. The carbohydrate is increased by five grammes every other month, alternating with an increase of five grammes of protein. The fat is decreased in proportion. The results of the treatment have been very encouraging. In nineteen of the thirty-seven patients treated the attacks ceased. Eight of these remained free from convulsions for from one to two and a half years,

the remaining eleven for from three months to one year. Thirteen improved considerably and twelve of these were still undergoing adjustment of their Three patients were free from attacks for from three to eight months, while they were under observation. No improvement was noted in one patient. All the patients show normal physical development. The mental development of the patients had been normal and exceptionally good in Resistance to infection seems to be in no way diminished by this form of treatment. It is too early to offer an explanation for these results. Wilder originally proposed ketogenic Wilder originally proposed acceptancies for the treatment of epilepsy on the theory that aceto-acetic acid should behave pharmacologically as an anæsthetic and reduce the anæsthetic and reduce reactivity of the nerve cell. All that can be said at present is that ketonuria with the high fat diet is a practical guide to treatment, even though it is not the only factor concerned in the metabolism. Acidosis is possibly a factor in controlling the attacks.

Hæmorrhage in the Newborn.

C. F. T. EAST, F. COVE-SMITH AND F. T. STRANGE (British Journal of Children's Diseases, April-June, 1925) report three cases of hæmorrhage in the first weeks of life of infants who came to autopsy. The first patient was a female infant of fourteen days old. Labour had been prolonged. Since birth blood and clots had been found continually on the diaper. The infant had gradually wasted and had not sucked for two days. On admission it was much wasted, ashy pale in colour, with sunken eyes. Blood appeared to be oozing from the vagina and rectum. In spite of treatment with subcutaneous injection of saline solution and horse serum, it died nine hours after admission. No petechiæ were seen on the skin, but four purplish areas resembling piles were noticed at the anus. At the autopsy there was seen a fairly large area of hæmorrhage under the pleura on the left half of the diaphragm. On opening the peritoneum quantities of bright red blood were found. There were also hæmor-rhages within the liver and on its surface. The stomach and intestines were normal and contained no blood. There was a hæmorrhage on the surface of the cervix of the uterus which extended into its substance. Evidently some of the hæmorrhages in the liver were old, but the recent hæmorrhage into the peritoneal cavity was the cause of death. The second patient was the first child of a woman, aged forty years. Labour was easy and at birth the child seemed normal. On the evening of the second day it passed per rectum a large quantity of blood. The bleeding continued and the child died on the following day. At the autopsy the intestines were found to be full of blood as far as the duodenum. Under the peritoneum of the first part of the duodenum a small bloodstained area was visible. This corresponded to a little ulcer on the mucous membrane which was situated

six millimetres from the pylorus. The stomach was dilated. Scattered all over it were tiny circular areas like little rings. In the microscopical sections of the stomach wall areas were detected where the mucous membrane had completely disappeared and erosion had taken place into the submucous connective tissue. The third patient was a male child, aged six weeks. It was brought to hospital with a history of some acute abdo-minal disorder lasting for twelve hours. The abdomen was distended and rigid. It was thought that a tumour could be felt and intussusception was suspected. The abdomen was opened, but no intussusception was found. The child died soon after the operation. At autopsy it was found that bleeding had taken place into the wall of the gut and oozing of blood from the mucosa. The contents of the gut were bloodstained at these places. There were other small hæmorrhages scattered over the surface of both kidneys. A hæmorrhage the size of a pea was found at the apex of the lower lobe of the left lung. The spleen was large and firm.

Concentrated Antitoxin in Scarlet Fever.

G. F. DICK AND G. H. DICK (Journal of the American Medical Association. March 14, 1925) report the therapeutic results obtained with concentrated scarlet fever antitoxin. Until 1924 when the authors described their concentrated scarlet fever antitoxin, no attempt had been made to concentrate any of the antistreptococcic sera for use in scarlet fever. Because of the frequent and severe reactions to which some deaths had been attributed, the use of Moser's serum was abandoned. It is well known that concentrated horse serum causes fewer and less severe reactions than the unconcen-trated. An efficient antitoxin, susceptible of concentration, may be readily produced by immunizing horses with sterile scarlet fever toxin. An amount of scarlet fever toxin corresponding to one thousand skin test doses is capable of causing general malaise, nausea, vomiting, a fever of 38.5° C. and a generalized scarlatinal rash in susceptible adults. The authors have taken the amount of antitoxin required to neutralize this dose of toxin as a basis for the standardization of scarlet fever antitoxin. Any antitoxin used should be of such strength that one cubic centimetre of the concentrated serum will neutralize one thousand skin test doses of the toxin. The authors describe their method of standardizing the antitoxin. They decided to employ as a therapeutic dose an amount of antitoxin sufficient to neutralize twenty times the quantity of toxin known to produce the characteristic symptoms of scarlet fever in adults. Each patient in the series treated with antitoxin received Each patient in the one such dose and to a few with severe infections two therapeutic doses were given. In order to make the test of the antitoxin as thorough as possible, it was given to patients who appeared

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to be most severely affected when they were first seen. The patients with less severe attacks were used as controls. Tables are given showing the complications and sequelæ which occurred in patients treated with antitoxin and in the controls. The authors conclude that the results reported indicate that concentrated scarlet fever antitoxin injected intramuscularly blanches the rash, lowers the temperature and improves the general condition of many scarlet fever patients. If the antitoxin is given early in the disease, the course is shortened and the incidence of complications and sequelæ is greatly diminished. One therapeutic dose suffices if given early in moderately severe attacks.

ORTHOPÆDIC SURGERY.

Osteitis Deformans.

PHILLIP LEWIN (Journal of Bone and Joint Surgery, April, 1925) reports a case of osteitis deformans in which a pathological fracture followed by union occurred. The patient was a female, aged seventy-four years, and had fractured her right thigh by stumbling on a rug. The author thinks it is probable that a pathological fracture caused the fall. the skiagram the characteristic signs of osteitis deformans of the bone of the right femur were seen. The fracture was treated by the application of two Lane's plates held in place by two Parham-Martin bands. Screws could not be used. A plaster spica was applied as a retentive apparatus. The metal plates had to be removed about one month after the operation had been performed and the plaster cast was removed four months after the operation. The calliper splint with a pelyic attachment was applied and the patient was allowed to walk with crutches. The patient was also treated with phosphorized cod liver oil, thyreoid extract and calcium lactate. The author believes that this is very important in producing bony callus.

The Substitution of the Erector Spinæ for Paralysed Gluteal Muscles.

PHILIP H. KREUSCHER (Surgery, Gynecology and Obstetrics, May, 1925) describes an operation for stabilizing the hip by substituting part of the erector spinæ for paralysed gluteal muscles. The author reports one case. The patient was a girl, aged ten, who had complete paralysis of all the muscles of the left lower limb with total instability. She had, however, some power in the ilio-psoas muscle. The patient was placed face downwards on the operating table and an incision about twenty centimetres (eight inches) long was made over the lower portion of the left sacro-spinalis muscle. The muscle sheath was exposed and split longitudinally and the outer half of the sacro-spinalis was detached

at the crest of the ilium and freed upwards for about fifteen centimetres (six inches). The sheath of the muscle was closed and the detached portion was left lying upon it. Silk sutures were placed in the prepared stump of muscle and were left sufficiently long to reach well beyond the greater trochanter. The greater trochanter was next exposed and a tunnel was made from this through the path of the gluteal region to open at the lower extremity of the first incision. Through this tunnel the sutures were drawn down and were fixed to the greater trochanter. At this stage the leg was brought into extreme abduction and the silk was tied with sufficient tension to draw down the stump of the sacro-spinalis muscle. To provide a smooth sliding surface for the silk a piece of fascia lata was sutured over the posterior aspect of the crest of the ilium. The author places his reliance for success of the operation upon the contention that the silk sutures become surrounded with fibrous tissue making artificial tendons. The result in the author's case is said to be satisfactory. The patient was able to place the entire weight of her body on the limb operated on and was able to walk without the use of a crutch or cane.

The Care of the Cripple.

F. J. GAENSLEN (The Journal of the American Medical Association, June, 20, 1925) says that the first requisite in the reclamation of the cripple is a hospital in which the acute conditions are treated or necessary surgical operations are performed. The stay of the patients in these hospitals should be relatively short. In a recent report on the work of the Shriners it was stated that the average hospital stay is ninety days. On the completion of treatment the patient should pass to a convalescent home where, in addition to postoperative treatment, facilities for systematic elementary and prevocational education should be pro-The third and fourth phases vided. in the reconstruction programme should be met by vocational training schools and social service bureaux for placing the individual in some in-These two phases are of great economic importance. In the United States there is an annual addition to the child cripple population of about 16,500; infantile paralysis causes roughly one-third of the increase. It seems reasonable, therefore, to have special laboratories devoted to the investigation of this disease with a view to finding some means of preventing epidemics. The disabilities resulting from neglected congenital deformities are a reproach to the These disabilities should be reported at birth whenever possible and efforts should be made to follow the patient until effective treatment is carried out. Rickets could be dealt with by the assistance of feeding clinics. For the treatment of the convalescent cripple there should be at least five convalescent beds provided

for the output of one hospital bed. One of the difficulties in dealing with the cripple problem is the education of the medical profession regarding what can be done for deformities. Too often cripples have been informed by their doctors that nothing can be done. The problem of the cripple is a State concern.

Congenital Dislocation of the Hip.

NATHANIEL ALLISON (Journal of Bone and Joint Surgery, April, 1925) is of opinion that the main difficulty in reducing hips in older children and young adults who have congenital dislocations, is the resistance of the capsule and the anterior structures about the hip. The obstacles to be overcome are abnormal development of the acetabular cavity, an irregular shape of the femoral head, an abnormal direction of the neck of the femur, shortening of the adductor of muscles before operation injury both of the muscle tissue and of the nerve supply, an abnormal shortening of the posterior muscles and of the fascia lata, an abnormal shortening and strengthening of the ilio-femoral ligaments. The author places particular emphasis on the last obstruction, for it is obvious that unless these structures especially the capsule and the ilio-psoas tendon be divided, the replacement of the head of the femur in the acetabulum is impossible. He divides the anterior part of the capsule in a preliminary operation and releases the ilio-psoas by section of the lesser trochanter and at the same time brings forward the head of the femurato a position directly above the head of the acetabulum. The patient is returned to bed and skeletal traction is then applied with the lower limb supported in a Thomas's splint. At the end of the third week the head of the femur of two patients was found to be proximal to the upper margin of the acetabulum. A second operation was then performed. The acetabulum was cleared of fibrous tissue and the head was replaced in the acetabulum. Two cases are reported in the second of which an osteotomy had to be performed to overcome the medial rotation of the femur after the dislocation had been reduced.

Epicondylitis.

RALPH M. CARTER (Journal of Bone and Joint Surgery, July, 1925) states that epicondylitis or a tennis elbow is a comparatively common affection. It follows certain sports, but the continuous use of a hammer or screw driver, wringing of clothes or similar occupations may give rise to the symptoms of the disease. It is usually of traumatic origin and has as a basic lesion a localized periostitis. author operated on two patients, but in neither was he able to find any trace of the bursa described by Osgood. On the other hand whether a bursa is present or not, patients treated by operation were freed from symptoms. Undoubtedly the most valuable treatment is rest. Diathermy should also be of value.

British Medical Association Mews.

MEDICO-POLITICAL.

ANNUAL MEETING OF THE DELEGATES OF THE AFFILIATED LOCAL ASSOCIATIONS OF MEMBERS WITH THE COUNCIL OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

The annual meeting of the delegates of the local medical associations affiliated with the New South Wales Branch of the British Medical Association together with the Council of the Branch was held at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, on October 2, 1925, Dr. R. B. Wane, the President, in the Chair.

The following delegates were present: Dr. G. M. Barron (Northern Suburbs Medical Association), Dr. W. S. Brooks (Western Suburbs Medical Association), Dr. K. S. M. Brown (Central Western Medical Association), Dr. E. W. Buckley (Northern District Medical Association), Dr. O. A. Diethelm (North Eastern Medical Association), Dr. A. M. Gledden (City Medical Association), Dr. E. H. Lee (South Eastern Medical Association), Dr. E. H. Loxton (South Sydney Medical Association), Dr. W. W. Martin (Southern District Medical Association), Dr. A. W. Mobbs (Balmain District Medical Association), Dr. J. T. Paton (Western Medical Association), Dr. J. T. Paton (Western Medical Association), Dr. A. T. Roberts (Central Northern Medical Association), Dr. W. F. Simmons (Illawarra Suburbs Medical Association), Dr. F. G. N. Stephens (Eastern Suburbs Medical Association), Dr.

Friendly Society Lodge Practice.

Several suggestions for minor amendments of the Common Form of Agreement were made by the delegates of some of the local medical associations. None were adopted. The opinion was expressed that the agreement was a fair and reasonable one and that it was working very smoothly to the advantage of individual lodges and their medical officers.

It was decided to recommend to the Council of the Branch that when an applicant for admission to a friendly society lodge was in receipt of a pension for some war disability which did not disentitle him to receive the medical benefit of the lodge, the military pension should not be taken into account as part of his income. The income limit clause would be interpreted on the basis of his income from all other sources.

It was noted that at a conference between representatives of the Friendly Societies' Association and the Council held on January 15, 1925, it had been decided to recommend that members of juvenile lodges should be accepted at reduced rates. At that conference the representatives of the Friendly Societies' Association had defined a juvenile as a boy between the ages of fourteen and sixteen years. A few days later the Secretary had written asking that a juvenile member be defined as a boy between the ages of eight and sixteen years. The delegates agreed to this definition. It was further resolved that the Council be asked to make arrangements for the following:

(ii.) To provide that the rate for attendance on juvenile members (a) where the lodge had its recognized meeting place within the boundaries of the Sydney metropolitan area—sixteen shillings per juvenile member per annum, (b) where the lodge has its recognized meeting place outside the boundaries of the Sydney metropolitan area—twenty-two shillings per juvenile member per annum.

(iii.) To provide in regard to sick pay certificates for juvenile members (a) that when the juvenile member is entitled to medical benefit in virtue of his parent's membership and to sickness benefit independently of his parent's membership, the fee payable to the medical officer for a sick pay certificate shall be two shillings and sixpence; (b) that when the juvenile member is not entitled to medical benefit in virtue of his parent's membership, but is entitled in virtue of his own membership to

medical benefit and to sickness benefit, the medical officer shall give the sick pay certificate free of charge.

(iv.) To provide for a fee of two shillings and sixpence for examination of a juvenile seeking to become entitled to medical benefit in virtue of his own membership and/or to sickness benefit.

(v.) To provide in respect of income limit that a juvenile member having income exceeding the prescribed income limit or whose father is ineligible for admission to the medical benefit of the lodge by reason of having income exceeding the prescribed limit, shall not become entitled to the medical benefit, the lodge secretary to certify that the parent's income is not above the prescribed limit.

(vi.) To provide that except where inapplicable the terms and conditions of the approved Common Form of Agreement shall apply to juvenile lodges.

Prevention of Hospital Abuse.

A spirited discussion on the subject of the prevention of hospital abuse took place. Views were expressed concerning the necessity for strict inquiry being made into the financial circumstances of patients applying for treatment at the public hospitals, whether through an industrial organization or otherwise.

The Practice of a Specialty.

After discussion it was decided to recommend to the Council to consider the advisability of amending the regulations dealing with the announcement that a member proposes to practise as a specialist. The existing regulation is as follows:

No member shall notify other members of the profession by means of a circular letter or otherwise that he practises or intends to practise as a specialist in any particular branch of medical science; provided that this restriction shall not apply in the case of a member who does not undertake the immediate care of patients, that is to say who does not attend patients except on behalf of or in consultation with the medical attendants of such patients.

Cooperation of the Medical Profession with the Public Health Authority.

On the motion of Dr. C. H. E. Lawes the following motion was carried:

That having regard to the fact that in the near future there is likely to be some extension of public health administration which may lead to medical practitioners being called upon to play a larger part in the administrative system than they do at present, the position be discussed of the medical practitioner in regard to public health and the prevention of disease with the object of determining what alterations should be made by law or otherwise in the relationship of practitioners to the public health administration.

Dr. Lawes referred to the Hone-Newland report which had been submitted to the Federal Committee. This report had been considered by the Branches and the Federal Committee had passed certain recommendations culled from the report. The full text of the report has been twice published in The Medical Journal of Australia (March 22, 1924, pages 296 to 299, and February 28, 1925, pages 220 to 223). The recommendations of the Federal Committee have been published in The Medical Journal of Australia, February 28, 1925, page 224.

Dr. J. Adam Dick said that the report was a very comprehensive one. The Federal Committee had devoted much time and energy to the matter. The aim of the Committee was to introduce uniformity throughout the Commonwealth. Each State and the Commonwealth were working independently under widely divergent laws. The changes would have to be introduced gradually. The proposals contained in the report and in the recommendations of the Federal Committee did not entail a heavy burden of extra

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work on the general practitioner. There would be an extension of the compulsory notification system and certain other duties for which adequate payment would be made. He suggested that the delegates might accept the report.

Nearly all the members spoke in favour of the report which was regarded as a very valuable one. Some members anticipated that there would be a considerable amount of added work for the general practitioner. The fees would have to be reasonable and not nominal. It was recognized that the Royal Commission on Health was dealing with the subject and the hope was expressed that in its report the Commission would set forth quite clearly all the details of the practical adoption of the Hone-Newland report.

Encouragement of Local Medical Associations.

It was decided to ask the Council, if possible, to arrange on request for leading members of the profession to attend general meetings of local associations for the purpose of reading papers or delivering addresses. The opinion was expressed that the subject of these papers or addresses should be notified to the local association before the meeting.

Prenatal Supervision of Mothers.

An opportunity was afforded the delegates to discuss a scheme for the provision of antenatal care throughout the State, as outlined in a memorandum of the Section of Obstetrics and Gynæcology.

Professor J. C. Windeyer and Dr. A. J. Gibson had kindly consented to attend the meeting to explain the scheme. PROFESSOR J. C. WINDEYER was received with applause. He said Dr. Brown Craig, Dr. A. J. Gibson and he had drafted a memorandum dealing with the improvement and extension of prenatal supervision of mothers and their unborn babies. This memorandum had been based on a consideration of the aims of prenatal supervision. The objective was the detection of any deviation from the normal in the mother at the earliest opportunity and if possible to rectify the abnormality. If it were found not to be possible to rectify the abnormal condition, the best means of alleviating the defect could be applied. This usually meant that the woman should be placed in a hospital under expert care. Early diagnosis of every abnormality was essential. In the next place Professor Windeyer considered the frequency of maternal abnormalities. He stated that contracted pelves were not as numerous among women in Australia as elsewhere. In Glasgow it was estimated that about 50% of all pregnancies were abnormal. He doubted whether more than 20% of pregnancies in Australia were abnormal. The majority of the women with abnormalities could be helped by prenatal supervision. For example the difficulties arising from contracted pelves, from breech presentations and from albuminuria could be overcome, if the conditions were recognized at an early stage.

Professor Windeyer then dealt with the results that followed the adoption of prenatal supervision. Under ideal conditions supervision followed by confinement in hospital reduced maternal mortality to one per thousand or less. Under less ideal conditions, that was supervision followed by confinement in the patient's home, the maternal mortality should be less than half the existing figure. He maintained that supervision removed to a great extent the need for vaginal examination during labour. As a consequence sepsis as a cause of maternal mortality and morbidity and vaginal and cervical lacerations would be lessened in their incidence. It had been shown that infantile mortality could be enormously reduced by supervision and yet infantile mortality was about ten times as great as maternal mortality. In Edinburgh the infantile mortality of 56% without supervision had been reduced to 13% by means of supervision.

Turning to the memorandum Professor Windeyer stated that in all circumstances an examination early in pregnancy should be carried out. If no abnormality were detected the second examination should be carried out at the thirty-third week. The third should be made at the thirty-seventh week. If necessary the second examination might be dropped, provided that no indications of any

abnormality existed. When an abnormality was detected, the repetition would depend on what had been found at the former examination. In regard to the nature of the supervision to be given, he pointed out that the scheme embraced improved education of the medical profession and of the midwifery nurses. The better training of students was a matter that was occupying his attention in another connexion. Similarly the improved training of nurses was being dealt with apart from the scheme. He thought that the medical profession could easily devise a plan for post-graduate instruction in prenatal supervision through the agencies of the local medical associations. The memorandum was merely an outline or skeleton and the details to convert it into a practical scheme could be devised by the medical profession.

The memorandum was then submitted to the meeting as

ollows:

The following aspects could in the first place be profitably considered in regard to an authoritative recommendation from the Council to the profession:

1. Medical men should decide whether it would not be advisable to make their obstetric fee an inclusive one which would embrace antenatal supervision as well as the actual confinement and ten days subsequently. This suggestion would apply to all cases where no marked abnormality exists. Where work and responsibility increased owing to abnormal conditions, the doctor must naturally assess his own value in accordance with circumstances.

Such a scheme will tend to popularize antenatal supervision and will reduce to a minimum the possibility of the doctor being regarded as endeavouring to make much out of what should be a normal process.

- 2. Since only about one-twentieth of total births occurs in public hospitals and even if antenatal clinics be amply supplied, the great bulk of obstetric cases will still remain in the hands of private practitioners, the main responsibility for seeing that antenatal attention is given to pregnant women devolves upon the individual practitioner.
- 3. Medical men should definitely discourage late engagements and impress upon the public so far as they are able the necessity for antenatal supervision.
- 4. Since the maternity bonus is apparently to be retained, the Commonwealth Government should be requested to pay the bonus only to those mothers who furnish a certificate from a medical man stating that they had received adequate antenatal care and attention. A small portion of maternity bonus could also be profitably utilized for subsidizing the training of selected women.

Suggested Organization. Education of Profession.

To discharge his responsibility in regard to antenatal supervision the general practitioner must first be impressed with the necessity of such supervision and instructed in the methods of carrying it out. This involves:

Education of general practitioners in both metropolitan

and country districts.

In metropolitan districts this is not a difficult matter, since facilities are at hand.

In country districts it will be difficult and unlessconsiderable time and money be expended, it will be impossible to touch more than a portion of practitioners. Nevertheless every effort will leaven the mass and the following are some of the means to this end:

- (i.) Lectures and demonstrations arranged in conjunction with the local medical association affiliated with the New South Wales Branch of the British Medical Association.
- (ii.) Post-graduate courses of lectures and demonstrations to be arranged with the Organization and Science Committee of the New South Wales Branch of the British Medical Association.

Training of Nurses and Medical Students.

The training of nurses or medical students is not touched upon since these matters are only indirectly connected with the question of antenatal and postnatal supervision by the profession.

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Apart from the use to which the clinics could be put for the education of both students and nurses, an essential for success is that obstetric nurses should receive periodical "refresher" courses. These would not only impress upon them their responsibility in the scheme, but also would encourage them to act as advocates for antenatal supervision.

Antenatal Clinics.

Antenatal clinics may preferably form part of a maternity hospital (maternity centre) in smaller districts or be separate units in more populous districts served by large maternity hospitals. In metropolitan areas the staffing of these clinics should be under control of these hospitals.

From these clinics the abnormal cases can be hospitalized. No difficulty will be experienced in staffing such clinics in metropolitan districts, but in smaller centres there is a risk of aggrandizing one medical man at the expense of others.

The clinics need not be elaborate, but should whenever possible be furnished in such a manner as to afford every inducement to pregnant women to feel comfortable and interested. The staff must be as numerous as will obviate the necessity for undue waiting. In the smaller clinics where a full-time nurse would be out of the question, it may be possible to obtain a roster from among the obstetric nurses in the district.

In the first place it is recommended that such clinics be opened in the more populous and industrial areas. The need is greatest here, every facility is at hand and the experience gained will be of the greatest advantage when extension to country districts is contemplated. So far as country towns are concerned, the local medical men are usually cognizant of all midwifery cases—actual or potential—and provided they (the medical men) do their part, there would be little need for clinics.

If it be desired to establish clinics in the larger country towns, it should be a universal rule that every medical man who wishes, should be on the roster of such clinic, so that each will attend for a certain period in turn. This will eliminate any misunderstanding or friction arising out of professional favouritism—imaginary or otherwise.

Maternity Hospitals.

Maternity beds should be available in an average proportion of about one in four thousand of the population. In some centres the proportion should perhaps be one in three thousand, in others one in five thousand; prematernity beds, one to every ten or twenty maternity beds, according to circumstances. It is impossible to lay down the number of beds which make the most desirable capacity, since this is subject to so many factors, for example, means of transport, distance, isolation, surrounding district and so forth. Other things being equal, the capacity should be such as will warrant a resident medical officer in order to gain the maximum efficiency.

If these maternity wards or centres form part of a general hospital, it is very essential that the nursing staff should be kept absolutely for maternity work. There have been several disasters in small hospitals where the staff has been utilized in gynæcological or surgical wards when maternity work was slack. They have eventually carried infection to the maternity portion. A cottage near such hospital should whenever possible be obtained for use as a hostel for waiting cases.

use as a hostel for waiting cases.

In districts other than the metropolis all medical men should be allowed the practice of the hospital.

Experience has shown that in all public maternity hospitals (excepting those in small country towns) where any distinction between "private" and "ordinary" patients is made, the public portion does not attract patients and the hospital in consequence is not as efficient as it might be and the result is often the loss of the "private" patients also. This will not apply to New South Wales to any extent since all private hospitals are in the hands of trained nurses, but in other States registered (but untrained) midwives can obtain a licence for a private maternity hospital.

Education of Prospective Mothers and the Public Generally.

This is very important and should be carried out by the individual practitioner, the profession as a whole, the Public Health Department, obstetric nurses and women's societies. The maternity centres will act as foci for the distribution of information, but more active propaganda in addition to these is necessary.

A booklet issued by the Health Department with the approval of the New South Wales Branch of the British Medical Association, setting forth the advantages of efficient care and supervision and the like would be extremely useful. This might be sent to every woman on the registration of her marriage.

Dr. A. W. Mobbs said that midwifery nurses did not want prenatal supervision. The chief offenders were the untrained nurses. He asked whether something could be done to give those untrained nurses who were on the register, some training for one or two months. He held that the medical practitioner was often made the scape-goat for the untrained nurse. Within a short time he had been called upon to attend three women who had died as a result of childbirth. In each instance he had been called in three days after the labour or even later. He thought that much good could be effected by having addresses delivered to mothers by members of the medical profession. It was necessary that the lecturer should not be a local practitioner.

Dr. E. H. LOXTON said that even the trained nurse persuaded the patient to do without the doctor. The fee payable to the nurse was often reduced if a doctor had to be called in.

Professor Windexer interposed at this stage with the remarks that the regulations under the Nurses Registration Act had been drafted, but had not been promulgated. Provision would be made to compel the nurse to advise that a medical practitioner be consulted in the case of primiparæ and of all women who had previously had an abnormal labour.

Dr. W. F. Simmons informed the meeting that a senior practitioner who had had a long experience in obstetric work, had been asked by his association to comment on the proposals embodied in the memorandum. The first suggestion was that the fee for attendance should be regarded as an inclusive fee to cover prenatal supervision as well as attendance during the labour and supervision for ten days after. The second matter was the frequency of confinement in hospital. It was held that one woman in every five was too high a proportion. No woman should be admitted to hospital for accouchement unless she presented herself before the seventh month. An antenatal clinic should be attached to every public hospital. The issue of a booklet was regarded as important.

Dr. O. A. Diethelm held that ideal methods could not be carried out in general practice. He admitted that much improvement was possible. He thought that the proposals in the memorandum were admirable. He held the opinion that the majority of general practitioners dealt with obstetrical conditions on scientific lines. He was of opinion that the Government should give financial assistance in order to establish a scheme based on the proposals.

Dr. H. H. Lee said that in the early days in Wollongong they had begun with "Sairey Gamp" and that stage had been bad. They had arrived at the stage in which "Sairey Gamp" had become almost unknown. Nearly all their patients were being attended by trained nurses. It was the "Sairey Gamp" type of nurse who disliked calling in the doctor. The trained nurse at times erred in the other direction and sent for the registered practitioner in normal cases. He found that prenatal care had increased very greatly. The majority of medical practitioners gave this supervision in some form. He favoured lectures to mothers by specialists.

Dr. G. M. Barron was pleased with the memorandum. He held that medical students were receiving far better training than the older men had got during their student ĩ

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days. He maintained that it would be years before the last of the "Sairey Gamp" type of nurse disappeared. She was not nearly as old as they would wish her to be. He advocated the establishment of maternity wards in connexion with the majority of hospitals, although he realized that there were difficulties to be overcome in some country districts. He also favoured the help that was being given by voluntary workers.

DR. A. T. ROBERTS was convinced that the problem of the high maternal mortality and morbidity was the problem of the nurse. In his district an investigation was being made of the qualifications of each obstetric Armed with the information that would be gathered, it was probable that the untrained nurse would be pushed aside. Medical practitioners would not be prepared to undertake the care of a woman during her confinement unless a trained nurse were engaged. realized that they could not refuse to go to the aid of woman in emergency, even if the nurse was of the "Gamp" variety.

DR. A. W. Mobbs expressed the opinion that every nurse should have general as well as obstetric training. In Queensland and in Victoria only generally trained nurses were able to be registered.

Dr. A. J. Gibson thought that it would be easy to get a scheme into action in the metropolitan and suburban districts, but difficult in the country. He thought that however desirable it might be for an obstetrical nurse to have general training, there were many real difficulties. The majority of the women who took the double training, did so in order that they might fill a position as matron at a private hospital. Many of those with double training did not seek obstetrical work. Moreover, there was a real shortage of adequately trained midwifery nurses.

Dr. T. W. Lipscomb raised the question whether or not all public hospitals should have a limited number of beds for obstetrical emergencies.

Dr. Gibson referred to Dr. E. S. Morris's essay in which he dealt with the conveyance of septic infection in small general hospitals with beds for obstetrical emergencies. If this were done it would be necessary to have a separate staff of nurses. Perhaps it would be sufficient if a few beds were reserved for the purpose in country districts and when a patient was admitted, the nurses could be brought in from outside.

Dr. J. T. PATON dealt with the difficulties that would arise if an attempt were made to establish an antenatal clinic in country towns with six or seven practitioners. It would be disadvantageous if one of the local practitioners were placed in charge and the plan of a roster would not be much better. He was in favour of instruction by experts in modern methods of supervision; a little coaching was all that was needed. Dr. Paton stated that in Orange the provision of private hospitals was sufficient for the greater part of the obstetric requirements of the community. Only rarely was it necessary to have a patient in a hospital equipped for surgical work. In these circumstances it would be impossible to reserve a ward for obstetrics. The rare emergencies were dealt with in the hospital without special arrangements. No one took exception to this and their results were satisfactory. He pre-sumed that the same would obtain in regard to other towns with eight to ten thousand inhabitants.

Dr. F. G. N. STEPHENS held that the problems of the incompetent nurse and the need for prenatal supervision could not be dealt with until the public had been educated to recognize the importance of both. Then and not till then would the women demand competent nurses and proper prenatal care. This could be done better by suit-able literature than by spoken words. Printed information conveyed a more lasting impression and was read many times. As the underlying idea became firmly embedded in the minds of the mothers, the untrained nurse would be squeezed out between the efficient service of the trained nurse and an educated public opinion. He insisted that the pamphlets must be well written and attractive. In the past hydatid disease in certain districts had been extremely common. The public had been educated concerning the dangers and frequency of the disease until it had become an easy matter to render it almost unknown.

PROFESSOR WINDEYER said that he was very gratified to have heard from Dr. Paton the state of affairs in Orange and other country towns in regard to the public and private hospitals. He had been trying to obtain this information. He had thought that one maternity hospital to serve a large district might have been necessary. if the country towns were so well supplied with private hospitals that the emergencies in obstetric practice could be easily met in the existing public hospitals, there might be no need for special maternity hospitals or wards. In regard to the problem of the untrained and trained nurse, he was satisfied that the "Gamp" type was gradually dying out. In the meantime it would be better to seek the aid of the midwifery nurse rather than the fully trained medical, surgical and obstetrical nurse.

DR. A. J. GIBSON hoped that there would not be too much gratuitous service given in the antenatal clinic. The service was a valuable one and it should be properly remunerated. He made three suggestions in regard to the methods of providing prenatal supervision in the suburban districts. The first was that resident medical officers at the Royal Hospital for Women or at the Crown Street Hospital could be drafted to suburban clinics, say five in different districts. The second proposal was that the local practitioners could conduct the clinics each in his own district. This method had the disadvantage that the position would act as an advertisement of the practitioners concerned. The third method was that the larger metropolitan maternity hospitals should cater for the suburbs by special arrangement. Dr. Gibson held that the most important matter was the education of the public and of the medical profession to take a real interest in prenatal work.

Dr. R. B. Wade moved a vote of thanks to Professor Windeyer and Dr. Gibson for having given them the benefit of their advice. He emphasized the fact that the insistence on prenatal care reflected the general tendency toward the recognition of preventive medicine. It was certain that such a scheme as the one they had been discussing could not be brought into being quickly and that it would meet with much hostility, particularly from the members of the medical profession. But eventually it would be put into practice to the great benefit of the community.

Votes of Thanks.

Hearty votes of thanks were accorded to the President, Dr. R. B. Wade, for his hospitality and for the manner in which he had conducted the meeting and to Dr. T. W. Lipscomb for his valuable services as secretary. Dr. Wade thanked the delegates for their attendance.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been elected a member of the Queensland Branch of the British Medical Association:

Anderson, Hugh Ward, M.B., Ch.M., 1924 (Univ. Sydney), Brisbane.

THE undermentioned have been nominated for election as members of the New South Wales Branh of the British Medical Association:

Ralston, John Windeyer, M.B., Ch.M., 1924 (Univ. Sydney), Bonalbo, via Tenterfield. Flynn, Michael Richard, M.B., 1919, Ch.M., 1920 (Univ. Sydney), Martin Road, Centennial Park.

Correspondence.

THE PRACTICE OF MEDICINE IN THE MIDDLE AGES.

SIR: I have read with much interest the paper of Dr. W. E. Blackall, of Fremantle on the practice of medicine in the middle ages, and the fact that you have published this article in your journal shows that at last the pro-fession in Australia is beginning to take an interest in the history of the past. On page 420 Dr. Blackall states when speaking of the School of Salerno, that the Regimen was first translated into English in 1575. This is either a misprint or an error.

The first printed translation into English was printed by Berthelet in 1530 and was translated by Thomas Paynel. In a recent bookseller's catalogue I find the following:

Regimen Sanitatis Salerni.-This boke teachinge all people to gouerne them in helthe, is translated out of the Latyne tonge in to englyshe by Thomas Paynel. Black Letter. 1541.

In his Finlayson Memorial Lecture in 1908 on "The Schola Salernitana, Its History and the Date of its Intro-duction into the British Isles," Sir Norman Moore states: "The first author in England in whose writings any

acquaintance with the Schola Salernitana is observable is Robert Grosseteste, Bishop of Lincoln from 1235 to 1253. We may conclude that the poem first became known in England in the middle of the reign of Henry III."

Sir Norman Moore describes the manuscript of Corpus Christi Library which dates from the second half of the fourteenth century and is one of seven manuscripts at Oxford, two of which are in English.

Yours, etc.,

L. COWLISHAW.

"Lawnie." Gordon Road, Lindfield. October 10, 1925.

Dhituary.

ARTHUR ANDREWS

WE regret to announce the death of Dr. Arthur Andrews which occurred at his residence, 80, Murdoch Street, Cremorne, on October 14, 1925.

Books Received.

THE MOTHERCRAFT MANUAL OR THE EXPECTANT AND NURSING MOTHER AND BABY'S FIRST TWO YEARS, by Mabel Liddlard, with an introduction by J. S. Fairbairn, M.A., B.M., B.Ch. (Oxon.), F.R.C.P., F.R.C.S.; Fourth Edition; 1925. London: J. & A. Churchill; Sydney: Angus & Robertson. Limited. Crown 8vo., pp. 184, with illustrations. Price: 4s. 6d. net.

AN INTRODUCTION TO OBJECTIVE PSYCHOPATHOLOGY, by G. V. Hamilton, M.D., with a foreword by Robert M. Yerkes, Ph.D., LL.D.; 1925. St. Louis: The C. V. Mosby Company, Melbourne: Stirling & Company. Royal 8vo., pp. 354. Price: \$5.00 net.

Wedical Appointments.

Dr. James Bentley (B.M.A.), has been appointed Acting Inspector General of the Insane and Acting Inspector General of Institutions for Inebriates, Perth, Western Australia.

Dr. Thomas Gordon Ross (B.M.A.) has been appointed Government Medical Officer at Townsville and Medical Officer to the State Children Department, Townsville, Queensland.

Medical Appointments Dacant, etc.

For announcements of medical appointments vacant, assistants, locum tenents sought, etc., see "Advertiser," page xviii.

ROYAL PRINCE ALFRED HOSPITAL, SYDNEY: Vacancies on Honorary Medical Staff.

WINTON HOSPITAL, QUEENSLAND: Medical Officer.

Medical Appointments: Important Motice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.		
New South Wales: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies Dispensary. Balmain United Friendly Societies Dispensary. Friendly Society Ledges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellow's Medica Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies Dispensary. North Sydney United Friendly Societies People's Prudential Benefit Society. Phenix Mutual Provident Society.		
Victorian: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association.		
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Diary for the Bonth.

- Ocr. 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 Ocr. 29.—New South Wales Branch, B.M.A.: Branch (Ordinary).
 Ocr. 29.—South Australian Branch, B.M.A.: Branch
 Ocr. 29.—Victorian Branch, B.M.A.: Council, Nomination Paper Issued. OCT. 30.—Eastern Suburbs Medical Association, New South Wales.

- OCT. 30.—Eastern Suburbs Medical Association, New South Wales.

 Nov. 3.—Tasmanian Branch, B.M.A.: Council.

 Nov. 6.—Queensland Branch, B.M.A.: Branch.

 Nov. 10.—Tasmanian Branch, B.M.A.: Branch.

 Nov. 10.—New South Wales Branch, B.M.A.: Ethics Committee.

 Nov. 11.—Victorian Branch, B.M.A.: Branch; last date of nominations for Council. Election of Scrutineers.

 Nov. 11.—Victorian Branch, B.M.A.: Council.

 Nov. 12.—Victorian Branch, B.M.A.: Council.

 Nov. 12.—South Australian Branch, B.M.A.: Council.

 Nov. 13.—Queensland Branch, B.M.A.: Clinical Meeting.

 Nov. 13.—Queensland Branch, B.M.A. Council.

 Nov. 13.—Western Australian Branch, B.M.A.: Organization and Science Committee.

 Nov. 16.—New South Wales Branch, B.M.A.: Organization and Science Committee.

 Nov. 17.—Tasmanian Branch, B.M.A. Council.

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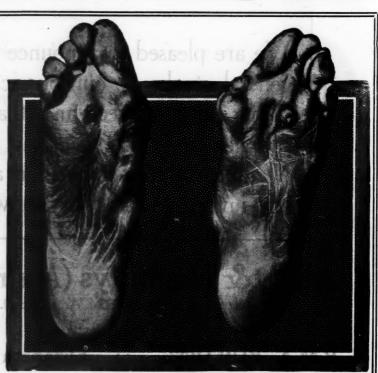
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